POOR LEGIBILITY

ONE OR MORE PAGES IN THIS DOCUMENT ARE DIFFICULT TO READ
DUE TO THE QUALITY OF THE ORIGINAL

16 July 1947

Property A/Hrs
Return to Dr. 1 D1

TM 9-850

WAR DEPARTMENT TECHNICAL MANUAL

CLEANING, PRESERVING SEALING, AND RELATED MATERIALS

ISSUED FOR

ORDNANCE MATÉRIEL

2485

U.S. 16406

WAR DEPARTMENT TECHNICAL MANUAL 1947

TM 9-850

This manual supersedes TM 9-850, 24 August 1944; TB ORD 74, 8 July 1943; TB ORD 312, 9 July 1945; TB ORD 323, 29 August 1945; paragraph 3 of TB ORD 331, 23 November 1945; TB 9-850-16, 30 November 1944; TB 9-850-18, 31 May 1945; TB 9-850-19, 26 June 1945; TB 9-850-20, 18 October 1945; and SB 9-31, 19 October 1944

CLEANING, PRESERVING SEALING AND RELATED MATERIALS

ISSUED FOR

ORDNANCE MATÉRIEL

WAR DEPARTMENT • *JUNE 1947*

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. - Price 20 cents

U.S.15880

WAR DEPARTMENT

WASHINGTON 25, D. C. 5 June 1947

TM 9-850, Cleaning, Preserving, Sealing, and Related Materials Issued For Ordnance Matériel, is published for the information and guidance of all concerned.

The information in this manual is correct as of 30 January 1947.

[AG 300.7 (25 Jun 46)]

BY ORDER OF THE SECRETARY OF WAR:

DWIGHT D. EISENHOWER
Chief of Staff

OFFICIAL:
EDWARD F. WITSELL
Major General
The Adjutant General

DISTRIBUTION:

AAF (5); AGF (2); T (10); Dept (5); AAF Maj Comd (2); Arm & Sv Bd (1); Tech Sv (2): FC (1); BU (1); PE (Ord O) (5); Establishments 9 (3); Dist 9 (3); Gen & Sp Sv Sch (5); Tng Ctr (2); A (ZI) (25), Overseas (3); CHQ (2); D (2); B 5, 6, 44 (1); R 2, 4–11, 17–19, 55 (1); SBn 2–11, 17–19, 44, 55 (1); Bn 9 (1); C 9 (1); AF (3); W (1); G (1); S (1); LS (1).

For explanation of distribution formula, see TM 38–405.

U.S.16408

CONTENTS

This manual supersedes TM 9-850, 24 August 1944; TB ORD 14, 6 July 1945; TB ORD 312, 9 July 1945; TB ORD 323, 29 August 1945; paragraph 3 of TB ORD 331, 23 November 1945; TB 9-850-16, 30 November 1944; TB 9-850-18, 31 May 1945; TB 9-850-19, 26 June 1945; TB 9-850-20, 18 October 1945; and SB 9-31, 19 October 1944

SECTION I
INTRODUCTION

1. General

This edition of TM 9-850 is a complete revision of the manual dated 24 August 1944, and contains changes relative to revised package sizes, new or improved procedures, and general information on many new and approved materials required for the proper maintenance and preservation of ordnance general supplies.

2. Purpose

a. The purpose of this manual is to provide using organizations and ordnance maintenance personnel with general information regarding the characteristics, units of issue, use, and application of cleaning, preserving, sealing, adhesive, and related materials.

b. All information contained herein is general in scope, and does not supersede instructions in War Department regulations or Technical Manuals for specific items of matériel.

3. References

The following publications will be used to complement instructions contained in this manual:

a. War Department Supply Catalog ORD 3 SNL K-1 for information concerning all of the materials listed throughout this manual in regard to specification numbers, stock numbers, container or package sizes.

b. TM 9-2852 for information concerning soldering, brazing, and welding materials, gases, and related items as listed in War Department Supply Catalog ORD 5 SNL K-2.

c. TM 3-220 for instructions on decontamination of ordnance matériel.

d. TM 9-2851 (when published) for information concerning paint, brushes, and related materials.

e. TM 9-2854 for information concerning packaging and shipping (posts, camps, and stations).

f. JAN-P-116 for methods of preservation.

SECTION II
CORROSION

General

a. This section covers a general discussion of preservative problems
l describes how corrosion is found on metallic surfaces; preparation
metal surfaces prior to application of preservatives, and application
l removal of preservatives.

b. It must be borne in mind at all times that the application of rust
eventives is only a temporary protective measure. Rust preventives
not a substitute for paint. Paint should always be used wherever
ssible and whenever its application will not harm the matériel.
nished as well as unfinished metal surfaces should be painted with
proved paints if at all practicable.

Corrosion

a. FORMATION. Rust is a compound formed by the oxidation of
n in the presence of moisture. There are two general types of rust,
med red rust and black rust. Black rust does not progress under
linary conditions. Red rust, on the other hand, might be termed
ectious as it will spread unless completely removed and a protec-
e coating placed on the metal surface to prevent it from reforming.
its earliest stages, rust or corrosion may appear as an almost invisi-
discoloration. This discoloration gradually darkens in color to a
lowish or reddish tinge and progresses until pits are formed. Pits
housandth of an inch in depth are plainly visible to the naked eye.
ce pits are formed, rusting progresses rapidly around the whole
ity of the pit, and soon a caked mass of iron oxide is projected
ond the surface of the metal. Rust can be removed by an abrasive,
by chemical means. The application of paint or a corrosion pre-
itive coating will greatly retard the progress of rusting. However,
propagation of rust can take place beneath these coatings. If
t has been removed by chemical means, it is most essential that
chemicals be neutralized and completely removed after the work
rust removal is finished. The surface must then be thoroughly
ed before the rust preventive coating or paint is applied. Sand-
sting may be used only where there is no possibility of the abrasive
ting into moving parts during or after the blasting operation. It
st not be used on artillery, small arms, bearings, bearing surfaces,
finely machined parts.

b. RATE OF CO ION. The rate of corrosion varies with the condi-
sure, atmospheric conditions, action of chemicals, chemical composition of the metal, and various other factors. Metals ordinarily employed in construction of ordnance matériel are universally subject to corrosion unless protected.

c. INSPECTION FOR CORROSION. (1) For prevention of rust, it is highly essential that the methods of examination of metal surfaces be such as to detect rusting in the initial stages. A plain metal surface after thorough cleaning can be best examined under a strong light so reflected that details of the surfaces are well defined. Slight discoloration or minute isolated particles of rust are less difficult to detect when a good magnifying glass is used.

(2) No rust preventive compound has been developed that will stop corrosion indefinitely. Careful periodical inspection is necessary, therefore, to determine the effective life of any corrosion preventive film.

(3) In the preparation of a surface for examination, the matériel must be cleaned with dry cleaning solvent (par. 61), then the solvent and dissolved material must be wiped off with a clean wiping cloth. Use of gasoline is prohibited. Abrasive or polishing material may remove evidence of corrosion and therefore must not be used prior to the examination.

6. Preparation of Surfaces

a. PRECAUTIONS. (1) Preparation of the metal surface prior to the application of a protective coating is most important as much corrosion is due to improper cleaning of the metal surfaces before the coating is applied.

(2) The metal surface must be clean, dry, and free of all traces of corrosion. The best preservative is practically worthless when applied on a dirty surface. To obtain maximum or even reasonable benefits from various preservative coatings, there should be no dirt residues under the coatings which could cause corrosion. Dirt residues may be defined as "any deposit foreign to the composition of a part." Such residues are usually present on parts unless definite preventive precautions are taken during processing.

(3) When cleaning metal and handling clean metal surfaces, gloves must be worn to protect the metal from acid stains and corrosion resulting from body perspiration.

(4) Care must be taken to remove all condensation or sweating, which occurs when metal is brought into a heated room from outdoors. A protective coating must not be applied until the metal reaches room temperature and is thoroughly dry. The protective coating should be applied immediately after cleaning procedures have been completed.

noved with dry cleaning solvent applied by means of a clean brush cloth soaked in the solvent.

(*a*) Special precautions must be taken before use to see that solvent free of water and dirt.

(*b*) Check solvent periodically for dirt content and replace it when-ır the content causes unsatisfactory cleaning.

(*c*) Cleaning should be done by a combination of soaking, scrub-ıg, or wiping.

(*d*) Immediately after cleaning, dry the parts with compressed air wipe dry with a clean dry cloth.

(*e*) Use solvent at room temperature.

(2) Usually the removal of surface rust is best conducted by the ɜ of abrasives or other mechanical means. If rust has progressed such an extent that pits are formed, polishing with abrasives, grind-ɡ, lapping, or buffing might not remove the rust from the pit.

(3) It is possible to dissolve iron rust with acids or specially pre-red compounds. This method of chemically cleaning steel surfaces not ordinarily employed on highly machined or highly polished ·faces, but may be justified under some conditions. Acids and simi-· material ordinarily dissolve not only the iron rust but also attack ɜ metal and are therefore objectionable. In case it is necessary to ɜ chemicals, care must be taken to remove every trace of acid from e surface of the metal; otherwise corrosive action beneath the pro-ːtive film may be accelerated later. The use of acids or other chem-ıls to remove rust must not be attempted unless authorized by the dnance officer responsible for the matériel.

Application of Rust Preventive Compounds

a. Rust preventive compound (heavy, light and medium (pars. 79, , and 81)) should be applied hot, in order to obtain fluidity to adhere the metal surface. However, in emergencies, the light compound ıy be applied cold. (Application temperatures should be as shown paragraphs 79, 80, and 81.)

b. The compounds may be applied by two methods.

(1) *Dipping.* (*a*) The dipping process is the most desirable as ere is less danger of the formation of air bubbles in the preservative m. The compound film cools quickly after application to the metal, us tightening the film. The film obtained by dipping is smoother d of a uniform thickness.

(*b*) Preliminary heating of the metal surfaces before dipping is ɔod practice, as it drives off a portion of the moisture film adhering the surface of the metal. The temperature of the metal, when pped, must be lower than that of the compound, in order to set the m as rapidly ·· possible after dipping; otherwise, too thin a film is good practice to allow the pieces dipped to remain in the solution for a short time. This permits absorption of the water film by the compound and heats the surface of the metal sufficiently to obtain good adhesion.

(*c*) The desirable thickness of the film is the maximum which will remain on the metal at the highest temperature to which it may be subjected in storage.

(*d*) Pieces containing bores or cavities must be dipped in such a manner as to allow the easiest escape of air and complete covering of all surfaces.

(*e*) After dipping, allow the pieces to drain until cooled to room temperature. The drippings are suitable for future use and must be neither wasted nor allowed to become contaminated with water, oils, or grease.

(2) *Swabbing.* (*a*) In case dipping is not practicable, swabbing is the preferred method.

(*b*) The compound must be heated to a slightly higher temperature than that necessary for dipping, as it cools before reaching the metal surface. In swabbing, several applications of compound are necessary, as the air must be worked out and a uniform coat applied.

8. Removal of Rust Preventive Compound

Rust preventive compound must be completely removed from all surfaces with waste or wiping cloths saturated with dry cleaning solvent before the matériel is returned to active service. Vapor degreasing may be used if available. For removal from easily accessible and small surfaces, scrubbing with dry cleaning solvent will be sufficient. However, for large and not easily accessible surfaces, the following procedure should be used: Using a steam jet, remove as much of the compound as possible. The compound will melt and run off. The remainder should be removed by alternately applying steam and scrubbing with a solution composed of four parts dry cleaning solvent or kerosene and one part grease cleaning compound. The heat from the steam will increase the solvent action of the solution considerably. After complete removal, the matériel should be rinsed with cold water to remove the solution which remains.

SECTION III
ABRASIVE MATERIALS

:loth, Abrasive, Aluminum Oxide

CHARACTERISTICS. A natural emery or artificial aluminum oxide sive on cotton drill or jean cloth. Various sizes of grain are lable as listed in SNL K–1, and the grain size of any particular is usually marked on the back of the cloth.

UNITS OF ISSUE. (1) Sheets, 9 by 11 inches, packaged in quires.) Rolls, 50 yards, width: 1, 1½, and 2 inches.

USE. (1) *Grades 2/0 and finer (grain size 100 and higher).* l for polishing, cleaning, and removing rust from finished iron steel surfaces in ordinary machine work, the finest sizes (4/0 and) being used for the more highly finished surfaces. Properly ified ordnance personnel may use grades as coarse as No. 2/0 for)val of burs from threads of breech blocks and breech recesses, :heck split rings, and gas-check seats, steel shanks of sight ntings, and bearing sleeves of range finder, and battery com- der's telescope tripods. No abrasive cloth coarser than 2/0 is iitted for work on breech mechanisms. To prevent unnecessary ', crocus cloth must be used on these mechanisms, when possible.

) *Grade 0 and coarser (grain size 80 and under).* Used generally 'emoving rust, burs, and other defects from unfinished iron and surfaces and in preparing such surfaces for painting. These se sizes must never be used on highly finished surfaces. Grade 0 be used on nonbearing finished surfaces where slight removal of l does not affect proper fit.

) *Rolls.* This type of aluminum oxide abrasize cloth is particu- adaptable to use on matériel being machined in a lathe and to : uses where the cloth is required to be used in long strips.

) *All grades.* Aluminum oxide abrasive cloth must never be on soft bearing metal such as brass, bronze, and babbitt as such ices become charged with the abrasive which then rapidly wears contacting metal. Whenever there is reason to suspect that y or aluminum oxide abrasive has entered any bearing, dis- nble it immediately and clean it thoroughly. Never use this sive cloth to polish commutators of generators since the abrasive will cause short circuits. Flint paper may be used for this pur- if the commu' · is not too deeply ridged or worn.

10. Cloth, Crocus

a. CHARACTERISTICS. Fine, soft, red, or reddish-brown powder (tripoli or iron oxide) on cotton drill or jean cloth.

b. UNIT OF ISSUE. Sheets 9 by 11 inches, packaged in quires.

c. USE. Used for cleaning and polishing finely finished surfaces such as rifle parts, breech blocks, gun slides, etc. First and second echelon personnel will use nothing coarser than crocus cloth for removing rust stains from highly finished surfaces. Whenever rusting or scoring is of such character that it cannot be removed with crocus cloth, ordnance personnel must be notified.

11. Cloth, Emery

See cloth, abrasive, aluminum oxide (par. 9).

12. Compound, Valve Grinding

a. CHARACTERISTICS. A compound composed of artificial abrasive and an oil or grease lubricant.

b. UNITS OF ISSUE. (1) Coarse, 2 ounces.
(2) Coarse, 1 pound.
(3) Fine, 2 ounces.
(4) Fine, 1 pound.

c. USE. For grinding valves of internal-combustion engines.

13. Disks, Sanding

a. CHARACTERISTICS. Disks of sandpaper of various types, sizes, and coarseness are available, as listed in SNL K–1.

b. UNIT OF ISSUE. Separate sheets having dimensions shown in SNL K–1.

c. USES. The type of sandpaper used on sanding disks varies in accordance with the type of work to be done. These types are referred to as special, open coat, and closed coat. The disks are used with motor-driven sanders, the disks being glued to the rotating element. The various sizes and types are used in shops for removing old paint and rust and for general conditioning of metal surfaces preparatory to painting.

14. Paper, Abrasive, Aluminum Oxide, Production Type

a. CHARACTERISTICS. This is similar to abrasive cloth aluminum oxide, but having a special construction and type of grain to provide a more rapid cutting action. Grain sizes are usually stamped on the back of the cloth.

b. UNIT OF ISSUE. Sheets 9 by 11 inches, packaged in quires.

c. USE. Used principally for wet sanding of bare metal with dry cleaning solvent preparatory to painting automotive and large artillery matériel.

Paper, Abrasive, Artificial, Waterproof, Silicon Carbide

CHARACTERISTICS. A silicon carbide abrasive on a strong, water- f paper backing. Various grain sizes are available as listed in K–1 and consist principally of finer grades than aluminum oxide sive cloth.

UNIT OF ISSUE. Sheets 9 by 11 inches.

USE. Used for wet sanding of painted surfaces where fine ies are desired, and where it is necessary to use water in connec- with the sanding operation.

Paper, Emery

See cloth, abrasive, aluminum oxide (par. 9).

CHARACTERISTICS. Has the same characteristics as cloth, abrasive, inum oxide, except that the abrasive is on a paper backing instead oth. This item has been canceled and aluminum oxide abrasive will be used in lieu thereof.

Paper, Flint (Sandpaper)

CHARACTERISTICS. Crushed flint rock of various grain sizes from 2/0 to No. 3 glued to heavy paper sheets. This is the common ty of sandpaper.

UNIT OF ISSUE. Sheets 9 by 11 inches in grades, packaged in s.

USE. Class B flint paper is generally used for sanding wood ces before painting and for metal surfaces where aluminum abrasive cloth cannot be used. (*See* cloth, abrasive, aluminum- (par. 9).) Typical uses are as follows:

No. 2/0. Sanding wood surfaces such as rammer staves and ing boards for varnishing; cleaning and smoothing generator iutators.

No. 1/2. Rubbing down under-coats of paint and varnish in ıration for the final coat. This is the coarsest grain allowed for ng down stocks of small arms.

No. 1 to No. 3. For rubbing down old coats of paint prepara- to repainting, the finer grades being used where an old coat is ir condition and the coarser grades where the old paint is in condition and must be removed before repainting. It has been l that grades No. 2½ and No. 3 are very rarely needed, and grades are to be canceled when present stocks are depleted.

Pumice, Ground

CHARACTERISTICS. A fine gray abrasive powder. It will polish ill not scratch glass.

UNITS OF ISSU (1) Fine (Class FFF) 1 pound.
(2) Medium (Class 0–½) 1 pound.

c. USE. Mixed with oil makes a satisfactory lapping compound for mating brass or bronze gears to steel gears.

19. Sand, Cleaner, Spark Plug

a. CHARACTERISTICS. A special, fine abrasive material resembling fine sand. Its hardness and abrasiveness is controlled so as not to produce excessive cutting of spark plug insulators during the cleaning operation.

b. UNIT OF ISSUE. Three pounds.

c. USE. Used in air blast type spark plug cleaners. Ordinary fine sand must not be used in these cleaners because it is so abrasive that it cuts the spark plug insulators excessively. Spark plug cleaner sand avoids this.

20. Silicon Carbide, Powder, Grade No. 120

a. CHARACTERISTICS. A manufactured abrasive powder.

b. UNIT OF ISSUE. Fifty pounds.

c. USE. For machine grinding edges of glass.

21. Wool, Steel

a. CHARACTERISTICS. A fluffy or wool-like mass of steel turnings or threads.

b. UNITS OF ISSUE. One-pound roll in three grades, as follows:
(1) Grade No. 0.
(2) Grade No. 1.
(3) Grade No. 3.

c. USES. A mild abrasive for rubbing down and smoothing wood or painted surfaces and for removal of light rust from steel parts. Its finely divided nature makes it particularly susceptible to rusting and consequent crumbling, after which it cannot be used for its intended purposes. Care must therefore be taken to store it in a dry place, protected from the elements.

SECTION IV
CLEANING MATERIALS

Acetone, Technical

CHARACTERISTICS. (1) A clear, colorless, volatile, and inflam-
le liquid. It has a sweetish odor, and is soluble in water and
ıol.
) Acetone is explosive when mixed with air. It is also toxic and
ɔnged exposure to the fumes will cause nausea, headache, and
tually chronic disease. It therefore must be used in open air or in
ll ventilated room and away from open flames.
) It must be kept in tightly sealed containers.
UNIT OF ISSUE. One gallon.
USE. To remove varnishlike deposits from engine parts such as
ɛs, valve stems, and carburetor parts.

Acid, Boric, ACS, Crystals

CHARACTERISTICS. A white crystalline powder, soluble in water
in alcohol.
UNIT OF ISSUE. One-pound screw cap bottle.
USE. Used as a flux in soldering and brazing. Used with sul-
: acid for decoating of optical lenses.

Acid, Chromic (Chromium Trioxide), Technical, Flake

CHARACTERISTICS. A red crystalline, strongly acid substance
ɔle in water. The dust of the flakes is very irritating and fumes
ıe solutions are injurious to the nose and throat as the acid is a
ɛrful, oxidizing agent.

ıution: Extreme care must be exercised to avoid contact with
and clothing.

UNIT OF ISSUE. Five pounds (airtight metal drums).
USE. (1) To apply dichromate finish to die cast carburetors
fuel pumps. (See *d* below.)
) Application of phosphate finishes such as Parco-Lubrite.
APPLICATION OF DICHROMATE FINISH. (1) *Preparation of solu-*
. The solutions prepared as described below are to be used for
ing the parts for a maximum of 25 carburetors or similar assem-
and should then be discarded. New solutions must be prepared
quired as fol'

(*a*) *Alkaline cleaning solution.* This solution is prepared by add-
ing 5 ounces of alkali type cleaning compound (par. 42) to 1 gallon of water. Provision must be made for maintaining this solution at a temperature of 180° F. to 200° F. during the treating operation.

(*b*) *Acid cleaning solution.* This solution is prepared by adding one-fourth pint (approximately one-half cup) of sulfuric acid, specific gravity 1.270, to 1 gallon of water. ***Caution:*** The mixing of sulfuric acid and water rapidly generates considerable heat. *Add acid slowly to water, stirring constantly,* to avoid spattering and hazard of acid burns.

(*c*) *Chromating solution.* This solution is prepared by adding 2 pounds of chromic acid flakes (approximately one-half of 5-lb package), one-half pound of nitric acid, 61 percent (par. 25) (one-half of 1-lb bottle), and one-half pint of sulfuric acid, specific gravity 1.270, to 1 gallon of water. ***Caution:*** Add the materials to the water *slowly in the order named, stirring constantly.*

(*d*) *Precaution.* The solutions prepared as described above are corrosive and damaging to the skin. The solutions will also attack steel or galvanized containers and must therefore, be prepared and used in an earthenware crock, a used battery case, or enameled pail. Wire hooks or racks to be used in handling parts being placed into or removed from these solutions must also be provided.

(2) *Procedure.* In order to provide a corrosion resisting finish, the following procedure must be followed:

(*a*) Remove zinc base die cast parts from disassembled units, brush off dirt or paint and rinse in dry cleaning solvent.

(*b*) Remove all nonmetallic and other removable components and wash the die castings with carbon remover solvent.

(*c*) Immerse the parts to be treated from 1 to 2 minutes in the alkaline cleaning solution prepared as described in *d*(1)(*a*) above and maintained at 180° F. to 200° F.

(*d*) Rinse parts in clear, fresh running water if possible, or in a large container (drum) of water.

(*e*) Rinse parts for about 10 to 15 seconds in the acid cleaning solution prepared as described in *d*(1)(*b*) above.

(*f*) Immerse the parts from 5 to 15 seconds in the chromating solution prepared as described in *d*(1)(*c*) above.

(*g*) Rinse parts thoroughly, in cool, clear, fresh running water if possible, or in a large container (drum) of clear water at room temperature.

(*h*) Rinse the parts thoroughly in warm, clear, fresh water maintained at a temperature of 130° F. to 140° F. Remove and blow excess water off with compressed air. Rinsing temperature must not exceed 140° F. (the maximum temperature the bare hand can stand) as any temperature above will destroy the protective coating.

(3) *Inspection.* Inspect the castings to assure complete coating. f any uncoated area exists, the parts must be retreated, using the rocess outlined above. Adequate treatment will be indicated by a ght brassy or iridescent to brown color of the treated parts.

5. Acid, Nitric, Technical Grade (61 Percent)

a. Characteristics. A colorless liquid soluble in water. The boil- ıg point is 86° C. It is highly corrosive and its fumes have a suffo- ıting action. ***Caution:*** Extreme care must be taken to avoid contact ·ith skin or clothing.

b. Unit of Issue. One-pound glass stoppered bottle.

c. Use. To apply dichromate finish to die cast carburetors and fuel umps.

d. Application of Dichromate Finish. See paragraph 24*d* for pplication of dichromate finish to die cast carburetors and fuel umps.

6. Acid, Phosphoric, Metal Conditioner, Concentrated

a. Type I—Wash-off Type. (1) *Characteristics.* A fluid consist- ıg of diluted phosphoric acid, containing water-soluble, nontoxic rease solvents.

(2) *Unit of issue.* Five-gallon bottle (for issue to shops, depots, nd arsenals only).

(3) *Use.* Dilute one part of concentrated phosphoric acid, type I, ·ith two to three parts of water. Brush the diluted mixture of phos- horic acid on the metallic surface. Scrub the wet surface well with rush, steel wool, or abrasive cloth, until the rust and grease are dis- ɔlved. Wash off the residue with water, preferably hot. If the hosphoric acid has dried, brush on fresh mixture before washing it ff. Wipe off the metal with dry cloths before the water dries. 'hosphoric acid may be used as a derusting solution in tanks, prefer- ɔly hot (140° to 160° F.), for severe rust.

b. Type II—Wipe-off Type. (1) *Characteristics.* Similar to type , except that the acid concentration is more dilute.

(2) *Units of issue.* (*a*) One gallon.

(*b*) Five gallons.

(3) *Use.* Type II is a solution of phosphoric acid and alcohols. t contains less acid and must not be used as a dipping solution in ınks. It does not need to be washed off but can be immediately wiped ff with a clean cloth. For either type I or type II, the treated parts ıust be painted or coated with rust preventive as soon as possible. ɔ not use the conditioner on electrical wiring, coil steel springs, or :her spring st

27. Acid, Sulfuric, ACS, Concentrated, Specific Gravity 1.835 at 15.5° C

a. Characteristics. An oily, highly corrosive liquid which is mis- cible in water in all proportions. ***Caution:*** Extreme care must be taken to avoid contact with skin or clothing.

b. Unit of Issue. One-pound, 75-pound, and 190-pound glass- stoppered bottle.

c. Use. For use as battery electrolyte. Dilute with distilled water to obtain desired specific gravity. Also used in metal pickling and cleaning of ferrous matériel. ***Caution:*** Pour acid into water; do not add water to acid.

28. Acid, Sulfuric, Reagent, 50 Percent Pure Sulfuric Acid by Weight

a. Characteristics. Refer to acid, sulfuric ACS concentrated SP 1.835 (par. 27).

b. Unit of Issue. One-pint bottle.

c. Use. Made especially for use as a control solution in the Parco- Lubrite process.

29. Alcohol, Denatured, Grade 2

a. Characteristics. (1) A clear, colorless, volatile, inflammable, poisonous liquid.

(2) Must not be used near an open flame.

(3) Must be kept in tightly sealed containers.

b. Units of Issue. (1) One gallon.

(2) Fifty-five gallons.

c. Use. (1) Antifreeze for sponging solutions. (See table I, par. 72*d*(2).)

(2) Preparation of paint and varnish remover.

(3) Emergency substitute for antifreeze compound. (See table I, par. 72*d*(2).)

(4) Emergency substitute for paint thinner.

(5) Solvent or brush cleaner for shellac varnish.

(6) To prevent ice formations in fuel tanks and fuel pumps. (In cold weather, add 1 pint to 10 gal of gasoline.)

(7) For cleaning hydraulic brake parts.

(8) Cutting shellac.

30. Alcohol, Ethyl, Grade 1

a. Characteristics. (1) A clear, colorless, volatile, and inflam- mable liquid.

(2) Must not be used near an open flame.

(3) Must be kept in tightly sealed containers.

b. Unit of Issue. One gallon.

c. Use. Cleaning of optics of sighting and fire control ment.

742108°—47——3

Burlap, Jute

CHARACTERISTICS. A coarse, heavy, loose-weave, 8-ounce cloth.
UNIT OF ISSUE. Forty inches wide, per yard.
USE. Placed over the bore sponge or brush for cleaning artillery
es.

Carbon Tetrachloride

CHARACTERISTICS. (1) A colorless, noninflammable liquid, with
odor similar to chloroform.
2) Vapors are heavier than air.
3) It is poisonous if taken into the body in vapor or liquid form.
adache, nausea, anasthesia, followed by the inflammation of the liver
kidneys, and in some cases, unconsciousness and death, may result.
4) If accidentally splashed into the eyes, it will cause considerable
n and watering. The eyes must be washed immediately with large
ounts of clean water.
5) In contact with the skin, it may cause slight irritation.
6) It must not be allowed to come in contact with hot surfaces as
omposition by heat will give off an extremely poisonous gas.
. UNITS OF ISSUE. (1) One pound.
2) One quart.
3) One gallon.
. USE. To clean electrical wiring and electrical mechanisms which
not be cleaned with an inflammable solvent because of the fire
ard.

Cheesecloth, White, Bleached

. CHARACTERISTICS. An open mesh cloth.
. UNIT OF ISSUE. 38½ inches by 5 yards, in waterproof envelope.
USE. For the drying of optical lenses and prisms.

Cleaner, Rifle Bore

. CHARACTERISTICS. (1) A water-in-oil emulsion which is clear
translucent when viewed by transmitted light.
2) This fluid dissolves corrosive primer salts deposited in the bore
mall arms after firing, and acts as a temporary rust preventive.
. UNITS OF ISSUE. (1) Two ounces (oval screw top).
2) Six ounces.
3) One quart.
4) One gallon.
USES. For cleaning bores of small arms and artillery after firing.
2-ounce can is carried by the individual soldier and is for cleaning
d and shoulder weapons only.

Cleaning Liquid, Watch Rinsing, Nonexplosive

s item has be nceled and dry cleaning solvent will be used in
thereof.

36. Cleaning Liquid, Watch Rinsing, Noninflammable

a. CHARACTERISTICS. A clear aqueous soapy solution containing ammonia and a detergent.
b. UNIT OF ISSUE. One gallon.
c. USE. An initial wash on L. R. electric watch cleaning machine.

37. Cloth, Batiste, White, Rose Pattern

a. CHARACTERISTICS. A fine grade of soft, lintless cotton cloth.
b. UNITS OF ISSUE. (1) Pieces 4 inches by 6 inches, 100 per packet.
(2) Box, 39 inches by 5 yards.
c. USE. Wiping cloth for certain fire control instrument elements when the slightest trace of lint may cause malfunctioning.

38. Cloth, Bore Cleaning

a. CHARACTERISTICS. A cotton flannel cloth 4 inches wide in 50-yard rolls.
b. UNIT OF ISSUE. 4-inches by 50-yard roll.
c. USE. A swab for cleaning barrels of cal. .50 machine guns and 20-mm cannon.

39. Cloth, Wiping, Cotton

a. CHARACTERISTICS. A cloth that is relatively free from lint.
b. UNIT OF ISSUE. (1) Five-pound bag.
(2) One hundred-pound bale.
c. USE. (1) Substitute for cotton waste especially when lint deposits may affect operation of the matériel.
(2) Substitute for sponges when washing vehicles.
(3) Application of strong soap, lyes, soda-ash, or other alkaline solutions which quickly deteriorate sponges.

40. Compound, Absorbing (Oil, Grease and Water)

a. CHARACTERISTICS. A granular substance possessing high absorption capacity.
b. UNIT OF ISSUE. One pound.
c. USE. To clean surfaces and floors of oil, grease, water, and allied products.

41. Compound, Cleaning

a. CHARACTERISTICS. A granular compound which loosens scales and rust from metal surfaces. It is noncorrosive and will not react on metal or rubber. The package also includes a powder which is used to neutralize the cleaner.
b. UNIT OF ISSUE. One pound four-ounce package.
c. USE. Cleaner and neutralizer for cleaning of internal combustion engine cooling systems.
d. APPLICATION. Cooling systems must be cleaned at lea ice a

r, before the antifreeze compound (ethylene glycol type, par. 72) ıstalled and again after it is removed. In addition, rusty or other- e contaminated coolant, or rust and grease deposits inside the radi- r indicate that cleaning of the cooling system is necessary. Clean- at the prescribed intervals will reduce clogging and overheating ı minimum, and will largely eliminate the necessity for corrective ıning by a higher echelon. If the cooling system is very dirty, or ɡged so that overheating occurs, the condition must be reported to nance personnel. The entire cooling system must be examined for ɪs (see paragraph below), both before and after cleaning and flush- . Heaters, water-cooled compressors, etc., connected into the cool- system must be cleaned together with the radiator and block. ıen the system is drained, the instructions in the pertinent Technical nual must be followed to assure that the system is completely ined.

1) *Cleaning.* (*a*) Open the petcocks which shut off the coolant m the heaters or other accessories, to allow for complete circulation ing the cleaning, flushing and draining. Run the engine, with the iator covered if necessary, until the temperature is within operating ge. Stop the engine, turn radiator cap to release pressure, and then ıove the radiator cap. After coolant temperature has dropped ɔw 200° F., drain the system by opening the drain cocks and remov- plugs in the radiator and block; check with the cooling system in caution plate on the instrument panel for position of drains, if vehicle is equipped with such a plate. If necessary, use a wire to p open any drain hole which tends to become clogged.

b) Disconnect the radiator overflow return tank, if the vehicle is equipped. Close the drain cocks and replace plugs; pour water wly into the radiator until the system is approximately half full. rt the engine and run it at idling speed while adding cleaning ıpound, in the proportion of one container of cleaner to every 4 lons of cooling system capacity. Complete filling the system with ɛr.

'aution: Do not under any circumstances mix the cleaning material h neutralizer, antifreeze compound, or corrosion inhibitor com- ınd. Never mix the water and the cleaning compound before put- ɡ them into the system. Do not spill the solution on skin, clothing, painted portions of the vehicle. If spilled, flush with clean water nediately.

c) Place a clean drain pan in position to collect the overflow, ng the overflow to maintain the level in the radiator, if necessary.

d) Replace the radiator cap and run the engine at fast idling ed, covering the radiator if necessary, until the coolant reaches a ıperature above 180° F. but not over 200° F. Do not drive the ıicle. Consta· ·heck the level in the radiator.

(*e*) If clogging of core (indicated by low temperature spots on core) is present, allow the engine to cool and pressure-flush the system as directed in (*b*) above and repeat cleaning operation.

(*f*) Stop the engine after it has run for 30 minutes at a temperature of at least 180° F. but not over 200° F. Turn radiator cap to release pressure. As temperature rise can be expected at shut-down, coolant temperature should be allowed to drop below 200° F. before draining, then remove the radiator cap and drain the system completely.

(2) *Neutralizing.* (*a*) Close the drain cocks, replace plugs, and pour water slowly into the radiator until the system is approximately half full. Start the engine and run it at idling speed while adding neutralizer compound in the proportion of one container of neutralizer to every 4 gallons of cooling system capacity. Complete filling the system with water. Replace radiator cap.

(*b*) With the radiator covered, run the engine idle for at least 5 minutes at the normal operating temperature. Then stop the engine.

(*c*) After first releasing pressure by partial removal of radiator cap, remove cap and allow coolant temperature to drop below 200° F. Open all drain cocks, remove plugs, etc., and drain system.

(3) *Flushing* (*manually*). (*a*) Close the drain cocks and replace plugs. Fill system with water, replace radiator cap, and start engine.

(*b*) Run the engine at fast idle keeping the radiator covered, if necessary, until the coolant is heated to the normal operating temperature.

(*c*) Drain the system by removing the radiator cap, opening all the drain cocks, and removing plugs. Repeat the flushing operation until the drain water is clear.

(*d*) Again allow the engine to cool and then clean all sediment and foreign matter from the radiator cap valves and the overflow valves. Blow insects and dirt from radiator core air passages with compressed air, blowing in a direction opposite to the normal flow of air when the engine is operating. Use water, if necessary, to soften obstructions.

(*e*) If the system is equipped with an overflow tank, flush the overflow tank and pipe by filling with water and then draining both completely.

(4) *Flushing* (*Pressure*). (*a*) Remove thermostat and hose connecting the engine block and radiator core.

(*b*) Clamp convenient length hose to radiator core outlet opening, and attach another suitable length hose to radiator inlet opening, to carry away flushing stream.

(*c*) Connect the flushing gun to compressed air and water pressure, and clamp the nozzle of gun in the hose attached to the radiator outlet opening. (See fig. 1.)

With radiator cap on tight, fill core with water. Turn on air ire in short blasts to prevent core damage.

Allow radiator to fill with water, and again apply air pres- is before. Repeat this process until the water comes out clear.

Clamp flushing gun nozzle firmly to a hose attached securely gine water outlet opening. Fill engine with water, partly cover- ngine water inlet opening to facilitate complete filling. (See .)

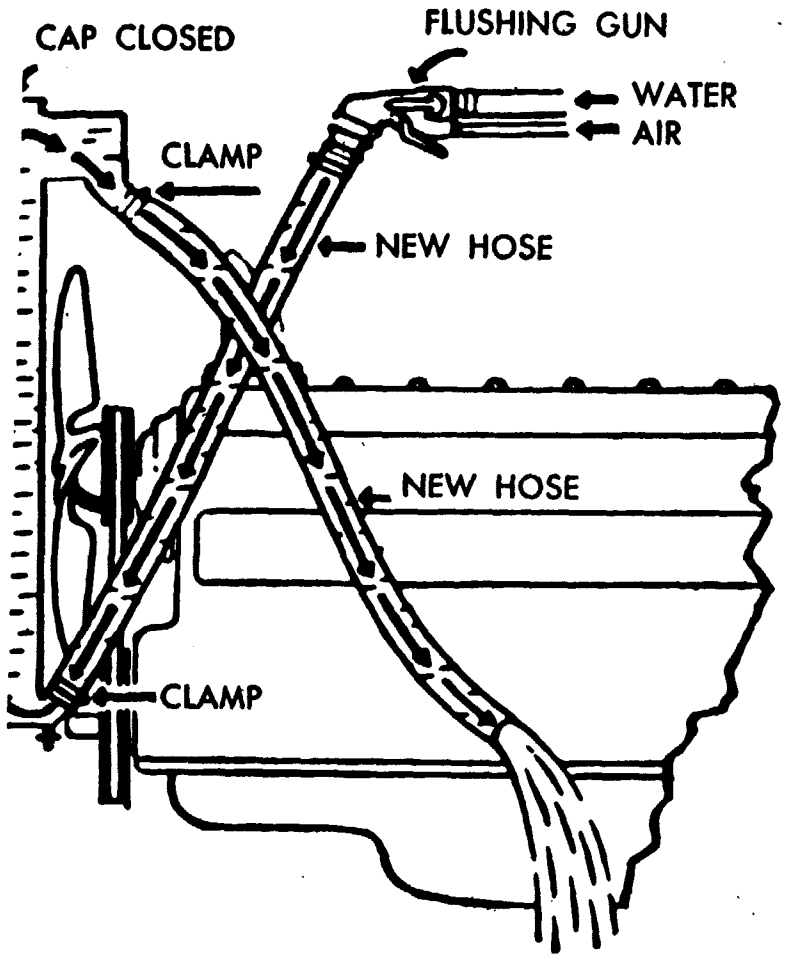

Figure 1. Pressure flushing of radiator.

r) Turn on compressed air to blow out water and loose sediment. eat filling with water and blowing out with air until flushing ım comes ou r.

COE406436

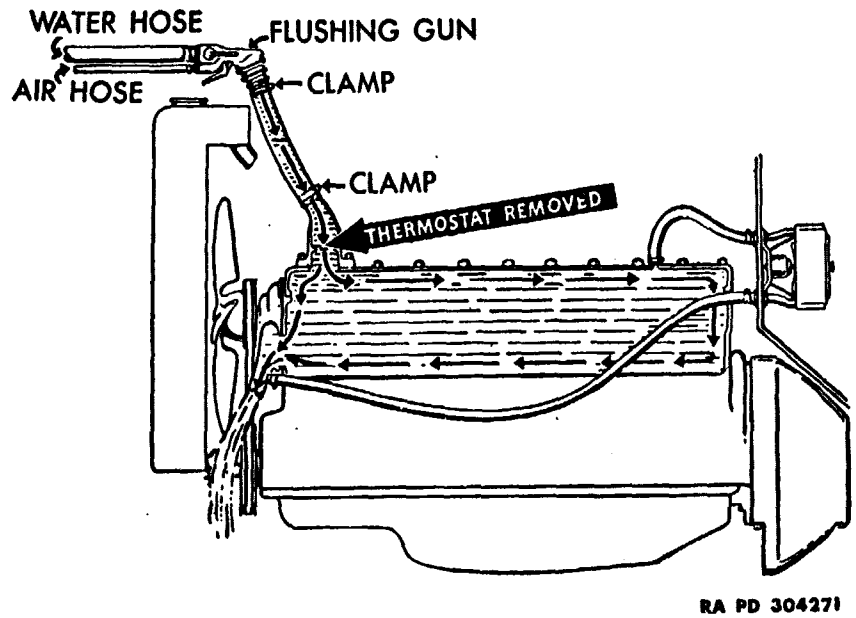

Figure 2. Pressure flushing of engine block.

(*h*) For most complete removal of sediment, repeat flushing of radiator core and engine block in opposite direction.

(*i*) For badly clogged engine water jackets that do not respond to regular pressure flushing, remove cylinder head studs, accessible water jacket covers, or core hole plugs and, with a suitable length of small copper tubing attached to flushing gun nozzle, flush jackets through jacket cover openings, stud, or core holes.

(*j*) When vehicle is equipped with a heater or other accessories such as overflow tank connected to the cooling system, flush heater, following the same procedure used for the radiator core.

(*k*) After completing the flushing operation and before connecting cooling system hose, clean off all water connections of both radiator and engine block. Clean out radiator overflow pipe, inspect, and, if necessary, lubricate the water pump and clean thermostat and radiator cap control valves. Check thermostat for proper operation before installation.

(*l*) Blow insects and dirt from radiator core air passages, using water if necessary to soften obstructions.

(5) *Leaks.* After completing the flushing operation, close the drain cocks and replace plugs. Pour water slowly into the radiator until the system is approximately half full. Start engine and run at idling speed, and fill the system completely. Stop the engine and examine the entire cooling system for leaks. This is important because the cleaning solution may uncover leaks which already exist but are

gged with rust or corrosion. Reconnect overflow tank if it had n disconnected and inspect caps and gaskets to be sure that they are good condition and fit securely. Leaks that cannot be corrected by using arm must be reported immediately to ordnance maintenance sonnel.

6) *Coolant service.* (*a*) When servicing the engine for operation anticipated temperatures above +32° F., nearly fill the system with an water. Add corrosion inhibitor compound (par. 74) in the portion of one container of inhibitor to each 4 gallons of cooling tem capacity including accessories. Then complete filling the sys- with water. The capacity of the cooling system can be obtained m applicable Technical Manuals.

b) When servicing the engine for operation at anticipated tem- atures below +32° F., use the procedure prescribed for reclaimed ew antifreeze, whichever is to be used. (See par. 72.)

7) For further supplemental information, see TM 9-2858.

. Compound, Cleaning, Alkali Type

. CHARACTERISTICS. An alkaline, granular, solid compound, solu- in water.

. UNITS OF ISSUE. (1) Twenty-five pounds.

2) One hundred pounds.

3) Four hundred pounds.

. USE. In shops to remove grease, tar, paint, etc., from metal parts radiators. Not to be used on aluminum or zinc.

'. APPLICATION. In dip tank. Solution of approximately 1 pound pound to 3 gallons water at 180° F. to 200° F.

. Compounds, Grease Cleaning

. CHARACTERISTICS. A compound soluble in kerosene or dry clean- solvent, the mixture of which emulsifies with water.

. UNITS OF ISSUE. (1) Five gallons.

2) Fifty-five gallons.

. USE. For dissolving grease and oil from engine blocks, chassis, parts.

'. APPLICATION. (1) Solution of one part compound to four parts erosene or dry cleaning solvent applied with brush or spray gun.

2) Removed by washing off with cold water.

. Compound, Paint Stripping, Alkali Type

. CHARACTERISTICS. An alkaline compound, soluble in water.

. UNITS OF ISSUE. (1) One hundred pounds.

2) Four hundred pounds.

. USE. In shops for removing paint, lacquer, and enamel from al surfaces. Not to be used on aluminum.

gallon of water, applied by flow, trickle, or brush.

45. Compound, Vapor Cleaning

a. CHARACTERISTICS. A granular product soluble in water. The solution, when applied hot to greasy surfaces, emulsifies the greases and oils so that they may readily be removed with hot water or steam.

b. UNITS OF ISSUE. (1) One hundred and twenty-five pounds.

(2) Four hundred and twenty-five pounds.

c. USE. Added to water for use in steam cleaning appliances, such as the Steam Jenny. ***Caution:*** When using vapor or steam cleaning devices, protect all electrical equipment such as generator regulators, generators, starters, distributors, etc., from direct impact by the cleaning jet. Either remove the accessory or protect adequately to prevent entry of moisture, which may cause a short circuit or corrosion. Clean electrical equipment with dry cleaning solvent.

46. Detergent, Lens-Cleaning, Liquid

a. CHARACTERISTICS. A heavy viscous yellow soap solution completely miscible with water.

b. UNIT OF ISSUE. 7½-pound jar.

c. USE. For final washing of optics before magnesium chloride coating.

47. Napkin, Cloth (Celanese), Lintless, With Hem

a. CHARACTERISTICS. A closely woven washable lintless cloth.

b. UNIT OF ISSUE. Eighteen inches by seventeen inches, 6 per waterproof envelope.

c. USE. For removing lint on optical lenses and prisms.

48. Pad, Cleaning, Precipitated Chalk

a. CHARACTERISTICS. A cloth pad containing powdered chalk.

b. UNIT OF ISSUE. Twenty-four pads in box.

c. USE. For the final polishing and cleaning of optical lenses and prisms.

49. Paper, Lens, Tissue

a. CHARACTERISTICS. A white, lightweight, delicate tissue paper.

b. UNIT OF ISSUE. Book of 100 sheets, 7½ inches by 11 inches.

c. USE. For cleaning optical glass or lenses of sighting and fire control matériel.

d. METHOD OF HANDLING. (1) Keep this paper in a dry, clean place, free from dust, dirt, or grit, which might scratch an optical surface.

(2) Do not use more than once.

742168°—47——4

Patches, Cut, Cotton Flannel

CHARACTERISTICS. A good grade of cotton flannel.

UNITS OF ISSUE. (1) 2½-inch squares, 1,000 to the package.

(2) 2½-inch squares, 20 per waterproof envelope for oversea shipment only.

(3) 2½-inch squares, 200 per bundle for domestic shipment only.

USE. Used in cleaning bores of small arms and machine guns.

Polish, Metal Paste

CHARACTERISTICS. An iron oxide base paste, so fine in consistency it has only a mild abrasive action.

UNIT OF ISSUE. One pound.

USE. For polishing metal surfaces. Not to be used on painted, finished, or lacquered surfaces, or on special finishes, such as brown- or parkerizing.

Remover, Paint and Varnish, Type II

CHARACTERISTICS. An inflammable organic solvent, with suit- evaporation retarders.

UNITS OF ISSUE. (1) One quart.

(2) One gallon.

USE. For removing paint and varnish from metal and wood aces.

Rouge, Jewelers', Polishing

CHARACTERISTICS. A molded stick of finely divided iron oxide.

UNITS OF ISSUE. (1) Stick for chromium.

(2) Stick for gold or silver.

USE. For polishing chromium, gold, and silver surfaces.

Rouge, Optical Polishing, Dry

CHARACTERISTICS. Extremely fine powdered iron oxide.

UNIT OF ISSUE. Four-ounce jar.

USE. To remove leach stains from optical elements.

Rouge, Red, Polishing, Molded, Hard, General Use

CHARACTERISTICS. An iron oxide molded bar free from active s, acids, and coarse particles.

UNIT OF ISSUE. 1½-pound bar.

USE. For polishing surfaces of silver, platinum, gold, brass, and less steel.

Soap, Liquid, Lens-Cleaning

CHARACTERISTICS. An issue cleaning solution made of castile , ammonium hydroxide, and distilled water.

b. UNIT OF ISSUE. One quart.

c. USE. Liquid lens-cleaning soap will be used by first and second echelons as a cleansing agent on eye lenses and objective lenses on optical instruments. Alcohol will not be used because it tends to dissolve a sealing compound used to seal the lenses in their cells and the cells to the instrument bodies.

d. APPLICATION. Liquid lens-cleaning soap will be applied to the outer surfaces of the eye lens and objective lens, with clean lens tissue paper, a sufficient number of times to loosen and remove all dirt without excessive rubbing. After the dirt is removed, the lenses will be polished with dry, clean lens tissue paper. Rinsing with water is not necessary.

Caution: Avoid breathing on a lens in cold weather, as condensation of moisture from the breath may freeze on the lens surface and make visibility difficult. The use of cleansing fluid with high moisture content, such as liquid lens-cleaning soap, will likewise be avoided in cold temperatures because of the danger of freezing.

57. Soap, Paste, Hand Grit

a. CHARACTERISTICS. A paste soap which quickly removes grease and oil from the skin. The hands must be slightly moistened before the soap is used. It is noninjurious to the skin and will not cause chapping or skin irritations.

b. UNIT OF ISSUE. One-pound can.

c. USE. A mechanic's hand soap.

58. Soap, Saddle

a. CHARACTERISTICS. A soft paste type soap especially prepared for the cleaning and preservation of leather. It readily emulsifies in water and the cleaning action is not as harsh as when other types of soap are used.

b. UNIT OF ISSUE. One pound.

c. USE. To clean and preserve leather. (See par. 62 for type of sponge used.)

d. APPLICATION. (1) Leather equipment is best cleaned by sponging with saddle soap and water. Repeated washings will necessitate replacement of oil to prevent the leather from becoming harsh and brittle. The leather when still moist must be given an exceedingly light coat of neat's-foot oil (par. 89) by rubbing with a soft cloth moistened (not saturated) with the oil. Wipe off any excess oil the leather does not absorb and rub to a polish, if desired.

(2) Nearly all Ordnance leather equipment is russet or fair leather, and, when these articles become soiled, they must be cleaned by carefully removing all hardened grease with a sliver of wood (not glass or knife), and washed with a sponge saturated with a heavy lather of

ldle soap and clean, tepid water. Rinse thoroughly with clear ter and rub vigorously with a dry cloth until the leather is dry.

ote. For moisture and moldproofing leather and articles made of leather, paragraph 76.

Caution: Do not use hot water or allow the leather to soak. Leather ıipment must never be washed with a strong cleaning solution con- ning alkali. Leather equipment, which has become wet, must be ed in the shade.

. Soda, Caustic (Lye)

. CHARACTERISTICS. (1) A highly caustic substance which readily solves in water. It is very destructive to the body and clothing, ısing burns on the skin. Special care must be taken to avoid getting r in the eyes.

2) If taken internally, give large dosage of vinegar or lemon juice, lowed by butter, olive oil, or cottonseed oil. Assist vomiting by nking large quantities of tepid water. Precautions must be taken prevent inhaling small particles when handled in a dry form.

(3) Solutions must be kept in containers of iron or glass. Do not use minum or galvanized containers.

. UNITS OF ISSUE. (1) Sixteen ounces.

(2) Ten pounds.

(3) Fifty pounds.

. USE. *Caution:* Do not use on artillery matériel or phosphate ishes of small arms.

(1) Preparation of target paste.

(2) To quicken the action of other cleaning solutions.

. Solvent, Carbon Remover

. CHARACTERISTICS. (1) A cleaning liquid which readily emulsifies h water.

(2) The cleaner is issued in two types called one- or two-phase. e two-phase contains an additional highly volatile ingredient which reases the cleaning action, but this quality results in higher loss io due to evaporation. No agitation of the cleaner is prescribed in ler to allow the less volatile ingredients to remain on top and thus ard evaporation. When possible, the cleaner must be used in its ginal container which has a removable top rather than to pour off ortion into another container.

. UNITS OF ISSUE. (1) Five gallons.

(2) Fifty-five gallons.

. USE. (1) To remove gummy deposits from carburetor parts.

(2) To clean fuel pumps.

(3) To clean pistons and other parts coated with carbon and varnish- e deposits.

COE406439

61. Solvent, Dry Cleaning (Stoddard Solvent) (Quartermaster Issue)

a. CHARACTERISTICS. (1) A colorless, inflammable liquid distilled from petroleum. It is not to be used near an open flame. Dry cleaning solvents should be handled in safety tanks, equipped with tight-fitting metal covers which should be kept in place when solvent is not in use. This is to minimize evaporation and contamination from moisture and dirt. Fire extinguishers should be provided.

(2) It evaporates quickly without leaving a corrosion-inducing film on metal surfaces.

(3) Continual use without gloves will dry the skin and may cause slight irritation. Antidote is to rub grease or oil into the skin to replace the natural oils.

(4) It is highly destructive to natural rubber hose, tires, and electrical insulation and must not be used on rubber parts of any nature. Rubber products must be cleaned with soap solution (¼ pound of soap chips to 1 gal water), rinsed with clean water, and dried.

b. UNIT OF ISSUE. Bulk: by the gallon.

c. USES. (1) For washing or cleaning all metal parts and bearings, with the exception of small arms and artillery matériel in the hands of troops and except during major overhauls when vapor degreasing may be used, if available. Small arms and artillery matériel are cleaned with dry cleaning solvent for the initial cleaning when covered with rust preventive compounds. Cleaning may be accomplished by immersing in the liquid, scrubbing with brush if necessary, or by swabbing with a cloth saturated with the cleaning fluid. All parts must be thoroughly dried before a coating of oil or grease is applied. Lubricant will not adhere to a metal surface wetted with solvent.

(2) To remove oil and grease spots from vehicle bodies and upholstery.

(3) Emergency cleaner for small arm and artillery bores.

(4) To clean air cleaners and breathers.

(5) Removal of rust preventive compounds.

(6) For rinsing watches on L and R watch cleaning machine.

62. Sponge, Cellulose, Coarse Pore, Rectangular

a. CHARACTERISTICS. A synthetic, cellulose sponge.

b. UNITS OF ISSUE. (1) Size 6 (medium), 1⅜ inches by 3¼ inches by 5 inches.

(2) Size 10 (large), 2¼ inches by 4⅜ inches by 6¼ inches.

c. USE. Used primarily for cleaning leather (par. 58) and similar materials. It is not for use with solutions containing soda-ash, trisodium phosphate, or caustic soda (lye).

63. Trichlorethylene Technical

a. CHARACTERISTICS. A clear, volatile, noninflammable liquid, inhibited against corrosion.

UNITS OF ISSUE. (1) Five gallons.
) Fifty-five gallons.
USE. Fluid for vapor degreasing equipment.

Trisodium Phosphate

CHARACTERISTICS. (1) A colorless, crystalline compound which luble in water.
) It is irritating to the skin. Personnel handling the solution wear rubber gloves. The solution will also deteriorate clothing.
) It must be kept in an airtight storage container.
UNITS OF ISSUE. (1) One-pound package.
) One hundred-pound bag.
USE. (1) Washing glassware.
) Washing painted surfaces. ***Caution:*** Only a small space must eaned at a time (approximately 2 sq ft), and the surface must be d immediately and dried with a wiping cloth; otherwise, an excess amount of paint may be removed.
PREPARATION FOR USE. (1) *Glassware.* Two tablespoonfuls of phate cleaner to each gallon of water.
) *Paint.* One-quarter cup of phosphate cleaner to each gallon of r.

Waste, Cotton, Colored

CHARACTERISTICS. Highly absorbent and, therefore, desirable for ing and wiping purposes. It has a tendency to shed during use must not be used where the strands will affect operation of the riel.
UNIT OF ISSUE. One hundred-pound bale.
USE. General wiping and cleaning where a better grade of ma- l is not required.

Waste, Cotton, White

CHARACTERISTICS. A better grade of cotton waste.
UNITS OF ISSUE. (1) Five-pound package.
) One hundred-pound bale.
USE. General wiping and cleaning.

Waste, Wool, Colored

CHARACTERISTICS. A fine grade of extra long fiber woolen waste.
UNITS OF ISSUE. (1) Five-pound package.
) One hundred-pound bale.
USE. Packing journal boxes and similar heavy bearing waste ced boxes.

COE406440

SECTION V
PRESERVATIVE MATERIALS

68. General

a. The preservative materials listed herein are intended primarily to protect matériel from rust, corrosion, or deterioration during periods of inactivity or shipment. They have no lubricating qualities and will not be used during active service unless otherwise indicated.

b. For specific preparation and application instructions, refer to appropriate Supply Bulletins and Technical Manuals for maintenance of matériel.

69. Agent, Webbing–A

Refer to compound, protective, strippable (sprayable), (see par. 77).

70. Belt Dressing and Preservative

a. CHARACTERISTICS. (1) The dressing is furnished in sticks that retain their solid form up to a temperature of 120° F.

(2) This material, when applied to belts, will not only preserve the leather but also increase the friction between the belt and its pulleys, and thereby decrease slippage.

b. UNIT OF ISSUE. One-pound stick.

c. USE. To be applied to all surfaces of leather belts by holding against the belt while in operation.

71. Capsule, Fungicidal, Aluminum, Filled

a. CHARACTERISTICS. A capsule containing 50 percent meta-cresyl-acetate and 50 percent ethyl cellulose.

b. UNITS OF ISSUE. Container. (1) Size 1 (500 per container).
(2) Size 2 (500 per container).

c. USE. For the prevention of fungi growth within sealed optical instruments.

d. APPLICATION. (1) To prevent the reflection of light rays from their aluminum surfaces, the fungicidal capsules must be completely covered with a thin coating of asphalt cement. (See par. 100.) The cement is melted in a container over a hot plate, applied to the capsules with a small brush, and allowed to harden.

(2) To obtain a good bond between the body of the instrument and the asphalt cement, apply a small amount of the cement to the designated portion of the instrument body and *heat the cement* by applying a heated iron for a short time. To obtain a good bond between the asphalt cement and the fungicidal capsule, apply a small a onal

U.S.15894

ıtity of cement to that on the instrument body while the latter ion is still soft, *heat again* and then *push the capsule into the ed cement.* Allow the cement to harden.

3) After the capsules have been cemented in position and the ce- t has been allowed to harden, *a small hole will be punched in each ule* with a sharp pointed tool such as a scriber. Make sure that ısphalt cement has hardened and that it will not flow over the holes, ıling the capsules and defeating the purpose for which they are nded. *The instrument will then be resealed immediately.* In ;copes M15, M60, and M70 series and battery commander telescopes 15 and M1915A1, it will be extremely difficult to punch a hole in capsule after cementing it in place. In these instruments, the hole be punched in the capsule before it is cemented in position; but must be taken to keep the hole free of cement and the instruments t be resealed promptly.

) To assure the effectiveness of fungicidal capsules, it is essential all treated instruments be carefully resealed. Sealing compound optical lenses is prescribed for resealing those portions of the in- ments which must be disassembled for installation of the capsules. following sealing instructions will be used:

) Work the compound until it is soft and pliable and roll it into read, normally about the thickness of a pencil lead. The thickness ıe thread will vary with the location for which it is intended, as ust be sufficient to give a complete seal with a minimum of excess pound to be cleaned off after the cover, cell, or optical element is sed or screwed into place. The thread must be made up as it is ed, because it will dry and harden very rapidly. (In the event some thread is inadvertently allowed to harden, it must be heated l it becomes soft again.) When covers or large sections of bodies o be sealed and it is not practical to use the compound in thread ı, the compound should be heated until it has the consistency of putty and should then be applied with a spatula.

) Whenever screws are to be resealed, a drop of lubricating grease cial) should be placed on the threads, a drop of shellac varnish ld be placed under the screw heads, and the entire heads should overed with sealing or plugging cement and spot painted. If ws do not affect the sealing of the instrument as a whole, they ld be covered with plastic modeling clay (formerly called "Plas- e"). (For special procedures in fungusproofing optical instru- ts refer to the following technical publications: TM 9–1530, TM 56, TM 9–1580, TM 9–1582, TM 9–1608, and TB ORD 331.)

Compound, Antifreeze (Ethylene Glycol Type)

CHARACTERISTICS. (1) A transparent, usually blue-green liquid, isting of eth glycol, plus a rust inhibiting compound

(2) When mixed with water in the prescribed proportions, that is, 60 percent antifreeze compound to 40 percent water, by volume, the resulting solution will not freeze at temperatures down to −60° F. This mixture produces the lowest freezing point; stronger solutions have higher freezing temperatures. Automotive matériel being shipped or stored will always be processed with a 60–40 mixture in the cooling system.

b. UNITS OF ISSUE. (1) One gallon.

(2) Fifty-five gallons.

c. USES. (1) Water-cooled internal combustion engine cooling systems below +32° F.

(2) Antifreeze for water-cooled machine gun jackets below +32° F. A 60 percent ethylene glycol and 40 percent water (by volume) solution is prescribed for these jackets.

d. GUIDE FOR PREPARING NEW SOLUTIONS. (1) Prepare the cooling system in accordance with directions outlined in paragraph 41*d*.

Note. Denatured alcohol, grade II, may be used as an emergency substitute for antifreeze compound (ethylene glycol type). (See table I.)

(2) The following table will be used in determining the amount of antifreeze compound necessary for protection at the specified temperature.

Table I. Guide for preparing fresh antifreeze solutions

Protection to—	Ethylene glycol type—pints of compound, antifreeze, to be added to make 1 gallon of antifreeze solution	Emergency substitute—pints of alcohol, denatured, grade 2, to be added to make 1 gallon of antifreeze solution	Protection to—	Ethylene glycol type—pints of compound, antifreeze, to be added to make 1 gallon of antifreeze solution	Emergency substitute—pints of alcohol, denatured, grade 2, to be added to make 1 gallon of antifreeze solution
+20° F.	1½	1½	−30° F.	4	4½
+10° F.	2	2¼	−40° F.	4¼	5
0° F.	2¾	2¾	−50° F.	4½	5½
−10° F.	3¼	3¼	−60° F.	4¾	6¼
−20° F.	3½	3¾			

Note.—To protect a gallon of water against freezing at specified temperatures, drain the pints of water specified in columns 2 or 3 for each gallon of water from the cooling system and replace with the same amount of antifreeze. Example: To protect a cooling system having a 12 quart capacity to −50° F. using antifreeze compound (ethylene glycol type), drain 13½ pints of water from the system and replace with 13½ pints of antifreeze compound. To protect the same cooling system for the same temperature with alcohol, drain 16½ pints of water from the system and replace with 16½ pints of alcohol. (The mixture of 60 percent antifreeze compound (ethylene glycol type) and 40 percent of water gives maximum protection. Stronger or weaker solutions of antifreeze compound have higher freezing points.)

INSTALLATION OF ANTIFREEZE SOLUTION. (1) After completion
leaning operation and thorough draining, fill system about one-
l full of water. Avoid water containing large amounts of min-
and/or impurities. Drinking water, soft or rain water is satis-
ory. Then add the amount of antifreeze compound required for
apacity of the entire system, including accessories such as heaters,
and fill with water to slightly below the filler neck.

) After installing the solution, run the engine until normal op-
ng temperature is reached and the thermostat is open then check
olution with a hydrometer and strengthen if necessary. Finally,
ystem to prescribed level.

ution: Do not add inhibitor to freshly prepared antifreeze
ions.

USE OF RECLAIMED SOLUTION. (1) Reclaimed solutions must be
up, as far as practicable, in administrative vehicles. Never use
imed solution in vehicles in combat service.

) Initial preparation of old solutions is accomplished as follows:

) Place drum containing the old solution on a rack and install tap.

) Test for strength with an antifreeze (ethylene glycol) hydro-
r and discard all solutions testing above +10° F.

) Strain a sample through muslin or several thickness of cheese-
into a clean glass container. Solution must be green or blue.
ard all solutions with brown or rusty tint.

) If the solution tests higher than the temperature to which the
ection is required, determine the amount of new antifreeze com-
d (ethylene glycol type) required to reach the desired protection
table II below. For example: If the solution tests +10 and the
ed protection is −30, reading the table indicates that 2½ pints of
reeze compound must be added to 5½ pints of reclaimed solution
ake 1 gallon (8 pt) of satisfactory antifreeze.

E II. *Pints to be added to old solution to make 1 gallon (8 pints) of reclaimed solution*

olution strength	Desired protection							
	+10	0	−10	−20	−30	−40	−50	−60
F	1	1½	2¼	2¾	3	3½	4	4¼
F		1	1½	2	2½	3	3¼	3¾
F			¾	1¼	1¾	2¼	2¾	3¼
F				¾	1¼	1¾	2¼	2¾
F					¾	1¼	1¾	2¼
F						¾	1¼	1¾
F							¾	1¼
F								¾

COE406442

(e) Strain the old solution through muslin or several thicknesses of cheesecloth into a clean container in which the quantities can be measured, and from which the solution can be poured into the radiator of the vehicle.

(*f*) Add the determined quantity of antifreeze compound for each gallon of reclaimed solution.

(3) When the cooling system is clean and tight, the strained antifreeze of the proper strength must be added. After filling to the proper level, add one container of corrosion inhibitor compound (par. 74) for every 4 gallons of antifreeze solution in the radiator.

Note. Any vehicle having an additional capacity, due to additional accessories, requires additional containers of inhibitor compound. The contents of the container must be poured into the radiator while the engine is idling and at normal operating temperature to obtain thorough mixing.

(4) While the engine is warm, the solution strength must be checked with a hydrometer and strengthened, if necessary.

(5) Inhibitor compound is available on requisition as compound, inhibitor, corrosion.

Note. If corrosion inhibitor is not immediately available, it must be added at the earliest possible moment.

g. NOTES ON USE OF ANTIFREEZE SOLUTION. (1) In service with either new or used solution, the coolant must be inspected weekly for strength and color. If the solution becomes rusty, it is to be discarded, the cooling system thoroughly cleaned, and new solution added. Do not discard rusty solution until new solution is available.

(2) In handling antifreeze solution, it is essential that it be kept clean. Use containers and water that are free from dirt, rust, and oil.

(3) Always use a prescribed and accurate hydrometer. To test the hydrometer, make a solution of one part antifreeze compound and two parts of water. This solution should give a reading on the hydrometer of protection to 0° F.

(4) Antifreeze compound (ethylene glycol type) is the prescribed antifreeze for use in ordnance vehicles, and jackets of water-cooled machine guns.

(5) For further supplemental information, see TM 9-2858.

73. Compound, Gum, Preventive

a. CHARACTERISTICS. (1) A solution of suitable oxidation inhibitors and metal deactivators in benzol or alcohol.

(2) When added in prescribed proportions to gasoline which has a tendency to form gum, but which has not begun to deteriorate, will prevent the formation and deposition of gum during storage periods up to 6 months.

UNITS OF ISSUE. (1) Four-ounce bottle.
2) One-gallon can.

USE. For treating the fuel in all vehicles or other equipment, ered by gasoline engines, or having gasoline auxiliaries, which are emain idle for 30 days or more.

. APPLICATION. (1) The fuel systems of equipment to be treated st be free from accumulated gum. Unless equipment is entering its storage, the following parts must be inspected and cleaned:

a) *Fuel pump.*
   1. Valves.
   2. Screens.

b) *Carburetor.*
   1. Screens.
   2. Accelerator pump plunger.
   3. Venturi of carburetor throat.
   4. Choke and throttle valves.
   5. Float mechanism.

c) *Fuel lines and fuel tank and screens.*

2) If gum is present in the above parts, it can best be removed with zol, acetone, alcohol, or a mixture of these solvents. Deposited gum ot readily soluble in fresh gasoline. When gum has dried, it may ecessary to resort to mechanical means to remove it.

3) Parts which cannot be thoroughly cleaned and freed from the a deposit without damage must be replaced.

4) After cleaning and reassembling, fill fuel tank half full with sh gasoline which has not been long in storage.

5) Add gum preventive compound in accordance with the follow- tables:

Fuel tank capacity	Amount of compound
30 gal	1 container (4 oz).
o 60 gal	2 containers (8 oz).
o 90 gal	3 containers (12 oz).

6) Fill fuel tank to capacity.

7) Operate the equipment at least 5 minutes. ***Caution:*** It is to pointed out that gum preventive compound is a preventive measure y and not a corrective agent. It cannot, therefore, be expected to ove gum which has already deposited nor can it be expected to pre- nt gum deposition from gasoline which has already deteriorated a result of storage. It is effective only as a means of improving storage char- -istics of fresh gasoline.

COE406443

74. Compound, Inhibitor, Corrosion (for Water and Ethylene Glycol)

a. CHARACTERISTICS. (1) A powder, soluble in water and water-antifreeze compound solutions.

(2) A corrosion inhibitor for both water and reclaimed antifreeze compound (ethylene glycol type).

b. UNITS OF ISSUE. (1) 2½ ounces.

(2) Five ounces.

c. USE. As a corrosion inhibitor for cooling systems of water-cooled engines and to re-inhibit reclaimed antifreeze compound (ethylene glycol type). (See par. 72*f*.)

d. APPLICATION. Five ounces inhibits 4 gallons of water or re-claimed water-ethylene glycol solution.

75. Compound, Insulation, Ignition

a. CHARACTERISTICS. (1) A clear liquid similar to varnish which establishes a waterproof coating when dry.

(2) It is easily applied with a brush or spray gun and dries to a hard, flexible finish. It dries dust-free in 15 minutes and can be handled in approximately 8 hours.

(3) The solvent used in this compound is inflammable and highly volatile. It must be applied in the open or in a well ventilated room, and away from open flames.

(4) Must be kept in a tightly sealed container at all times.

b. UNITS OF ISSUE. (1) Two-ounce bottle.

(2) One quart.

(3) Five gallons.

(4) Fifty-five gallons.

c. USE. (1) Waterproofing ignition wires, battery cables, and other electrical parts.

(2) Rustproofing external surfaces of engines.

d. APPLICATION. (1) This compound contains the correct percentage of solvent; additions of solvent will not be made.

(2) Brush or spray gun may be cleaned immediately after use with dry cleaning solvent, volatile mineral spirits or paint thinner.

Caution: This material is not a conductor of electricity. Do not use on disconnected battery terminals, wiring connections, or ignition wire terminals; or on the insides of distributor caps or similar parts, as it will prevent the flow of electricity. Do not apply to hot surfaces of automobile engines.

76. Compound, Leather Dressing, Preservative for Field Treatment

a. CHARACTERISTICS. This compound is a mixture of a chemical fungicide, wax, and suitable solvents which is applied by dipping,

ishing, or any other suitable means to prevent the growth and
opagation of mildew.

). Unit of Issue. Five gallons.

). Use. For moistureproofing and moldproofing leather and arti-
s made of leather.

Note. Treating of leather articles with this compound will be accomplished by inance maintenance personnel only. Leather articles located in or to be pped to, tropical areas will receive this treatment. In other areas, the treatnt will be applied only on special instructions.

d. Application. (1) *Equipment.* The compound must be heated obtain the necessary penetration of the leather but the container ist not be directly exposed to open flame. A 5-gallon can, or a soline or oil drum cut in half, can be utilized as a dipping vat. The eferable method of heating is to place the vat in a vessel of hot ıter, thus producing a double boiler effect.

(2) *Cleaning.* Prior to treating, clean all leather articles thorghly with saddle soap in accordance with procedure described in ragraph 58.

(3) *Treating procedure.* (*a*) Fill the vat with sufficient compound cover completely the largest leather article to be dipped.

(*b*) Heat the treating solution, using steam or hot water, to 45° C. 13° F.). Maintain the treating bath at 41° to 46° C. (106° to 115°) during treatment.

(*c*) Immerse items for 10 minutes. The solution must be agitated ntinuously during treatment and items must be placed so that no · pockets are present.

(*d*) Remove items and drain. The solution must not be heated ove 50° C. (122° F.).

Caution: This treating solution is inflammable. Care must be taken ıring all steps of the treatment. The compound contains highly latile components which rapidly evaporate when exposed to the air. ıntainers must be kept securely covered when not in use and stored the coolest location available. In the event a container is left unvered for an extended period of time, the contents must be disrded, as loss of the volatile constituents will destroy the protective ıalities of the compound. Only sufficient compound to treat each tch of articles should be withdrawn from a container. Any excess ust be discarded, as it cannot be saved for future use.

(4) *Drying procedure.* (*a*) The solvents in the treating compound e injurious to equipment such as optical equipment, etc. It is ıportant, therefore, that the leather articles be thoroughly dried after e treating process.

(*b*) Treated items may be satisfactorily dried if suspended in freely rculating air for at least 48 hours.

(*c*) The dry[illegible] time may be reduced by placing them in a hot box or forced draft oven at 50° to 55° C. (122° to 131° F.) for 15 to 20 hours. Such a hot box must be well ventilated to remove the vapors given off during drying.

(*d*) When the leather articles are thoroughly dry, remove the excess wax from the surfaces by wiping lightly with a dry cloth.

(5) *After treating.* (*a*) Treated articles must be cleaned when possible with a clean, dry cloth, or a cloth dampened with water. Repeated use of saddle soap will remove the treating compound and necessitate re-treating to obtain the desired protection.

(*b*) Dry-cleaning compound must never be used to clean treated leather articles under any circumstances as it will quickly remove the protective compound.

77. Compound, Protective, Strippable (Sprayable)

a. Characteristics. A sprayable, bridgeable, adhering, vapor sealing waterproofing, strippable, protective combined plastic and asphaltic compound. Final strippable film coating is composed of the following three types:

(1) Type I—A sprayable, bridgeable, strippable protective plastic.

(2) Type II—A sprayable, adhering, vapor sealing and waterproofing mastic compound suitable for topcoating Type I compound.

(3) Type III—A sprayable, aluminized compound suitable for topcoating Type II compound.

b. Units of Issue. None specified. As desired by installations performing strippable film operations.

c. Use. Where specifically prescribed for preservation of matériel in storage.

78. Compound, Retreating, Water-, Weather-, and Mildew-Resistant (for Cotton Duck and Webbing)

a. Characteristics. (1) A highly inflammable, uniformly dispersed, lump-free compound containing pigments, binders, water repellents, and fungicides.

(2) Does not corrode brass or galvanized iron and does not have any deteriorating action on wood or bast fibers.

(3) Prevents growth of mildew.

b. Units of Issue (Quartermaster Issue). (1) One gallon.

(2) Five gallons.

(3) Fifty-five gallons.

c. Use. For protection of cotton duck and webbing from deterioration by water, weather, and mildew.

d. Application. Applied by brushing or spraying.

Caution: Inflammable; keep away from open flame. Compound contains strong fungicide in a solvent. Do not treat clothing to be

l in intimate contact with the skin, or equipment to be used for
l or drinking water containers. Keep compound off skin. Wash
l after using. Use solvent spray precautions.

Compound, Rust Preventive, Heavy (CH)

. Characteristics. (1) A nondrying, heavy petrolatum type
ipound.
2) It provides rust protection for long periods.
3) This compound is suitable for application by dipping, brush-
, or swabbing at a temperature of approximately 190° F. Do not
t higher than 210° F.
4) This material is not a lubricant and all traces of it must be
ioved from matériel before it is placed into service. Removal can
iccomplished by vapor degreasing or by scrubbing with dry clean-
solvent.
. Units of Issue. (1) Five pounds.
2) Twenty-five pounds.
3) Four hundred pounds (for base shops, posts, arsenals, etc.,
y).
. Use. (1) For long-term protection of unpainted metal surfaces
ing storage or shipment, as prescribed.
2) Protection of exterior surfaces exposed to the weather, where
ioval of rust preventive by vapor-degreasing or solvent washing
racticable.
3) Typical items are gun bores, exterior or breech blocks, auto-
tive chassis points, and other parts where removal will not be too
icult.
. Application. (1) Must be applied hot by dipping, swabbing,
brushing.
2) See paragraph 7 for application of rust preventive compounds.

. Compound, Rust Preventive, Light (CL)

. Characteristics. (1) A light, nondrying petroleum product.
2) It provides rust protection for relatively long periods, where
preserved surfaces are not directly exposed to the elements.
3) This compound is suitable for application by dipping, brush-
, or swabbing at a temperature not over 150° F.
4) This material is not a lubricant and it must be removed before
tériel is placed into service. It is removed by the same methods
d for rust preventive compound (heavy).
. Units of Issue. (1) Five pounds.
2) Twenty-five pounds.
3) Four hundred pounds (for base shops, posts, arsenals, etc.,
y).
. Use. (1) F[illegible] protection of unpainted metal surfaces during

storage or shipment, as prescribed, where the preserved surfaces are not directly exposed to the elements.

(2) When used for storage, the matériel must be inspected at least once a year and the coating removed if there is any evidence of rusting.

(3) For preservation of intricate mechanisms from which it would be too difficult to remove the heavy rust preventive compound.

(4) Typical items are breech mechanisms, small arms, and small parts or assemblies which are wrapped and boxed or stored indoors.

d. Application. (1) Must be applied hot, by dipping, swabbing, or brushing.

(2) See paragraph 7 for application of rust preventive compounds.

81. Compound, Rust Preventive, Medium

a. Characteristics. (1) This compound is a petroleum base and is homogeneous, stable, noncorrosive, nondrying, nonpoisonous, rosin-free material. The compound is intended to protect ferrous metal surfaces against corrosion for a period of approximately one year in indoor storage. Melting point is 140° F. This compound is suitable for application by dipping, brushing, or swabbing at a temperature not over 170° F.

b. Unit of Issue. Four-hundred-pound drum.

c. Use. To protect polished surfaces and is best applied by dipping. (See par. 7.)

Caution: To avoid decomposition do not heat the compound over 170° F.

82. Compound, Rust Preventive, Special

a. Characteristics. A soft, buttery material.

b. Units of Issue. (1) Five pounds.

(2) Twenty-five pounds.

c. Use. To protect antifriction bearings against corrosion in storage or shipment. The compound should be applied by dipping, and should not be heated above 150° F.

83. Compound, Rust Preventive, Thin Film (CT)

a. Characteristics. (1) A liquid consisting of a nonfluid, waxy compound cut back with a volatile petroleum solvent.

(2) It is applied cold by dipping, brushing, or spraying (par. 7), and when dry forms a hard, thin film which will protect against rusting during indoor storage for a period of 1 year. It can be applied over painted or other surfaces without harmful effect.

(3) It is adhesive and difficult to remove. It must not, therefore, be used on any mechanism from which it would be difficult to remove by vapor degreasing or swabbing with dry cleaning solvent.

(4) The solvent used in this compound is volatile and inflamma-

. It must be applied in the open or in a well ventilated room, and ay from open flames.
(5) Must be kept in a tightly sealed container at all times.
b. Units of Issue. (1) One gallon.
(2) Five gallons.
(3) Fifty-five gallons.
c. Use. (1) Restricted to only specifically prescribed uses. Most the prescribed uses formerly prescribed are now covered by com- und, rust preventive, transparent.
(2) Do not use on small arms, machine guns, breech and firing chanisms, and similar parts where depreservation would be diffi- lt or on matériel not stored in closed warehouses, etc.
d. Application. (1) This compound contains the correct per- ıtage of solvent; additions of solvent will not be made.
(2) For cold application only; heat will not be applied at any ıe.

l. Compound, Rust Preventive, Thin Film (Polar Type), Navy Specification 52–C–18, Grade II

a. Characteristics. (1) A semisolid solvent rust preventive com- und which pours at −25° F.
(2) It is applied by spraying, brushing, dipping, or flushing sur- ːe to be protected from rust or corrosion.
(3) Although providing an extremely protective film, it is easily noved with kerosene, Diesel oil, or engine oil. Requires no special noval procedure before normal operation of engine other than, ter running of engines with prescribed lubricant until engine has ıched operating temperature, a draining and refilling of the engine

(4) The solvent used in this compound is volatile and inflammable. ːep away from open flames and apply in well ventilated quarters. ɔntainer must be tightly sealed at all times. Contents should be ıll shaken before using.
(5) This compound is prescribed for most preservative uses for- ːrly prescribed for oil, engine, preservative, PE 10 or 30.
b. Units of Issue. (1) One gallon.
(2) Five gallons.
(3) Fifty-five gallons.
c. Use. Protection of internal surfaces of engines and/or other mponents of power trains or similar oil lubricated assemblies when aced in standby or long-term storage. Also for protection of ex- rnal surfaces of bin stored matériel when specially prescribed.
d. Application. (1) This compound contains the correct percent- ːe of solvent; *additions of solvent will not be made.*
(2) Unnecess- ‘o heat compound for application.

a. Characteristics. (1) A liquid consisting of a nonfluid compound cut back with a volatile petroleum solvent.
(2) Applied cold by dipping, brushing, or swabbing and when dry forms a thin, hard film which will protect against rusting during indoor storage for approximately 1 year. Can be applied over painted or like surfaces without harmful effect.
(3) Adhesive and difficult to remove. It must not, therefore, be used on any medium from which it would be difficult to remove by vapor degreasing or swabbing with dry cleaning solvent.
(4) The solvent used in this compound is volatile and inflammable. It must be applied in the open or in a well ventilated room, and away from open flames.
(5) Keep in sealed container.
b. Units of Issue. (1) One gallon.
(2) Five gallons.
(3) Fifty-five gallons.
c. Use. (1) Exterior surfaces on all binned matériel; on all matériel stored in shops waiting to be fabricated or matériel to be used in repair of assemblies and for uses where compound, rust preventive, thin film, was formerly prescribed.
(2) Essentially the same compound as compound, rust preventive, thin film, but has the added feature of being transparent. This feature enables inspection of stored matériel without the necessity of removing and reapplying protective film.
(3) Do not use on small arms, breech and firing mechanisms, and similar parts where depreservation would be difficult. Do not use for outdoor storage of matériel.
d. Application. (1) Additions of solvent will not be made. Compound contains correct percentage of solvent.
(2) Apply cold. Do not use heat.

86. Desiccant, Type V, Grade A

a. Characteristics. (1) A high adsorption capacity, ungraded, granular type of activated dehydrating agent.
(2) Must be kept tightly sealed in original container until ready for use.
b. Units of Issue. Sealed drums furnished in five sizes as follows:
(1) One hundred 2-ounce bags in 25-pound sealed container.
(2) Three hundred and sixty 4-ounce bags in 100-pound sealed container.
(3) Two hundred 8-ounce bags in 100-pound sealed container.
(4) Ninety 16-ounce bags in 100-pound sealed container.
(5) Twenty 5-pound bags in 100-pound sealed container.

c. USE. As a dehydrator when preparing matériel and parts for rersea shipment, long-term storage, etc.

7. Oil, Lubricating, Preservative, Medium

a. CHARACTERISTICS. (1) A highly refined mineral lubricating oil, ntaining additives, with a maximum pour point of 20° F.
(2) Readily removable by washing with dry cleaning solvent.
b. UNITS OF ISSUE. (1) Two-ounce can.
(2) One quart.
(3) Five gallons.
(4) Fifty-five gallons (for shops, depots, arsenals, etc., only).
c. USE. As prescribed by War Department Lubrication Orders for reservation as well as lubrication of artillery and small arms atériel.
d. APPLICATION. (1) By oily cloth.
(2) By oilcan.

3. Oil, Lubricating, Preservative, Special

a. CHARACTERISTICS. (1) A highly refined mineral lubricating oil, ntaining additives, with a maximum pour point of −70° F.
(2) Readily removable by washing with dry cleaning solvent.
b. UNITS OF ISSUE. (1) Two ounces (oblong screw top can).
(2) Four ounces (oblong can with spout).
c. USE. As prescribed by War Department Lubrication Orders r preservation as well as lubrication of artillery and small arms atériel, and for certain oilcan points of automotive matériel.
d. APPLICATION. (1) By oily cloth.
(2) By oilcan.

). Oil, Neat's-Foot

a. CHARACTERISTICS. (1) A pale, yellow animal oil for the soften- g and preserving of leather.
(2) It is not a satisfactory lubricant for any purpose.
b. UNITS OF ISSUE. (1) One quart.
(2) One gallon.
c. USE. Preservation of holsters, gun slings, and other leather uipment. It is not to be used on harness.
d. APPLICATION. (1) Leather must be first cleaned with saddle ap and thoroughly dried. (See par. 58*c*.)
(2) In cold weather, heat the oil until lukewarm but not hot. Rub l well into the leather and then hang up to dry.

). Oxidizing Material, Black Finishing (for Ferrous Metals)

a. CHARACTERISTICS. A white alkaline crystalline material
b. UNIT OF I One hundred-pound drum.

COE406447

c. USE. To produce a black, nonmetallic, corrosive-resistant finish on ferrous metals.

91. Phosphatizing Material, Black Finishing

a. CHARACTERISTICS. A black liquid which produces a nonreflective corrosion-resistant coating.
b. UNIT OF ISSUE. Fifty-five gallon drum (local procurement).
c. USE. Used in Parco-Lubrite process which changes the surface of steel or cast iron to a nonmetallic phosphate coating that absorbs and retains oil.

92. Phosphatizing Material, Black Finishing, Manganese Phosphate Type

a. CHARACTERISTICS. A yellowish-white water soluble powder.
b. UNIT OF ISSUE. Two hundred and fifty-pound bag.
c. USE. A chemical compound used to change the surface of iron or steel to a corrosion resistant finish.

93. Phosphatizing Material, Gray Finishing, Zinc Phosphate Type (Initial Make-Up Liquid)

a. CHARACTERISTICS. A colorless liquid chemical compound.
b. UNITS OF ISSUE. (1) Three hundred and fifty-pound barrel.
(2) Five hundred and seventy-five-pound barrel.
c. USE. The phosphatizing material produces a smooth corrosion-resistant finish on the exterior surfaces of small arms.

94. Phosphatizing Material, Gray Finishing, Zinc Phosphate Type (Replenishing Liquid)

a. CHARACTERISTICS. A colorless liquid chemical compound.
b. UNITS OF ISSUE. (1) Three hundred and seventy-five-pound barrel.
(2) Six hundred-pound barrel.
c. USE. Used as a replenisher for initial liquid.

95. Solution, Coating, Type B

Refer to compound, protective, strippable (sprayable) (par. 77).

96. Wax, Insulating, Moisture- and Fungus-Resistant

a. CHARACTERISTICS. A blend of micro-crystalline waxes containing a chemical fungicide.
b. UNIT OF ISSUE. Ten-pound block (approximately).
c. USE. For treating antiaircraft artillery electrical components to protect against deterioration from moisture and mildew. The recommended pouring temperature is 210° to 230° F.

SECTION VI
ADHESIVE AND SEALING MATERIALS

7. Adhesive, Stickum

a. CHARACTERISTICS. (1) A liquid cement consisting of natural reclaimed rubber dissolved in a volatile solvent.

(2) The adhesive is in no way harmful to paints, enamels, and her finishes.

(3) When applied, the solvent volatilizes at normal temperatures form a nondrying tacky adhesive.

b. UNIT OF ISSUE. One quart.

c. USE. For applying stencils.

d. APPLICATION. (1) Applied by brush or spray to the backs of encils.

(2) It must be allowed to set-up tacky before applying the stencil.

(3) After the stencil has served its purpose, it can be removed adily. The adhesive will remain on the back of the stencil and will ›t come off on the painted surface.

8. Butyl Peroxide (Ditertiary) Catalyst

a. CHARACTERISTICS. A clear, colorless water-insoluble liquid with fruity odor.

b. UNIT OF ISSUE. One-ounce amber bottle (A7570263).

c. USE. Used with cement, thermo-setting, for cementing optical nses. (See par. 114.)

9. Canada Turpentine

a. CHARACTERISTICS. (1) A yellowish to greenish, transparent, ›ncrystalline material with a pinelike odor.

(2) Soluble in xylene.

b. UNITS OF ISSUE. (1) In sticks (6 sticks to box).

(2) Dissolved in xylene, 2-ounce bottle.

c. USE. Optical cement.

00. Cement, Asphalt

a. CHARACTERISTICS. A high-melting-point black bituminous ma-rial.

b. UNIT OF ISSUE. One-pound can.

c. USE. To ment fungicidal capsules into binoculars. (See ar. 71.)

101. Cement, Gasket (Liquid Type)

a. CHARACTERISTICS. A nondrying, elastic, heat-resisting semi-fluid adhesive.

b. UNIT OF ISSUE. One-pint can with brush.

c. USE. For assembling fuel line connections particularly pipe ells at fuel pumps. For use on threads and metal-to-metal joints. Also used on uncoated gaskets between cylinder block and cylinder head on Cadillac Light Tank engines.

102. Cement, Gasket (Plastic Type)

a. CHARACTERISTICS. A soft, plastic, nonhardening gasket sealing material, Permatex No. 2.

b. UNIT OF ISSUE. Eight-ounce tube.

c. USE. For coating gaskets, motor blocks, gear housings, flanges, etc., where high temperatures are encountered.

103. Cement, Glass

a. CHARACTERISTICS. A viscous, air-drying cement which, upon setting, retains rubberlike characteristics.

b. UNIT OF ISSUE. One pint.

c. USE. For sealing windshields in metal frames.

104. Cement, Jewel, Shredded

a. CHARACTERISTICS. Brownish threads approximately 1 inch long. Material is easily fused at low temperatures.

b. UNIT OF ISSUE. Vial.

c. USE. For sealing pallet and roller jewels of watches.

105. Cement, Liquid, Butyl, Tent Patching, Waterproof

a. CHARACTERISTICS. (1) A volatile, solvent solution of synthetic rubber, pigmented with carbon black to produce a black cement.

(2) When applied, the solvent volatilizes at normal temperatures and leaves a flexible, insoluble-in-water film that is not affected by normal temperature changes.

(3) One medium application will provide a strong adherent, flexible, waterproof bond.

b. UNIT OF ISSUE. One pint.

c. USE. For patching canvas material of all types, such as tarpaulins, and protective covers for matériel.

d. APPLICATION. (1) To be applied with a brush to the patch and to the section of canvas to be patched. Approximately 15 minutes drying time must be allowed before the patch is applied.

(2) The cement will be allowed to set for approximately 24 hours at normal temperatures.

6. Cement, Porcelain, Liquid

a. Characteristics. A viscous pastelike material which dries to ard white substance.

b. Unit of Issue. One-half-pint can.

c. Use. For cementing porcelain insulators for heating elements optic coating machine.

7. Cement, Rubber, Natural, Nonvulcanizing

a. Characteristics. (1) A liquid, consisting of a rubber com- und mixed with volatile solvents.

(2) When applied, the solvent volatilizes at normal temperatures form a suitable bond between metal and rubber. ***Caution:*** This nent is unsatisfactory for bonding metal to synthetic rubber, such neoprene or Buna N.

b. Units of Issue. (1) Two-ounce tube.

(2) One-pint tube.

(3) One-quart can.

(4) One-gallon can.

c. Use. For cementing metal to rubber, except synthetic rubber :h as neoprene or Buna N.

d. Application. (1) The surfaces of the metal and the rubber ıst be cleaned thoroughly by washing with clean unleaded gasoline carbon tetrachloride.

(2) Smooth rubber surfaces must be scuffed to permit a better bond :ween the rubber and metal.

(3) One coat of the cement will be applied uniformly with a brush both the rubber and metal surfaces, and allowed to dry for not ›re than 20 minutes. When the cement film becomes tacky, the rfaces must be pressed firmly together, and allowed to set for proximately 48 hours at room temperature.

8. Cement, Rubber, Natural, Vulcanizing, Hot-Process, Fast-Drying, Black

a. Characteristics. A vulcanizing cement containing a minimum 0.55 pound of crude rubber per gallon, with no reclaim.

b. Units of Issue. (1) Five-gallon can.

(2) Fifty-gallon drum.

c. Use. For tire recapping, retreading, sectional repairing, and be repairing.

9. Cement, Rubber, Synthetic

a. Characteristics. A light brown colored air-curing liquid nent with a bonding range of 5 to 15 minutes.

b. Unit of Issue. Two-ounce tube.

c. Use. For nting synthetic rubber to metal.

110. Cement, Rubber, Synthetic, Nonvulcanizing

a. Characteristics. A black viscous rubber cement, self-curing at low temperature and water resistant.

b. Unit of Issue. Eight-ounce tube.

c. Use. Waterproofing artillery and for other uses where heat for vulcanizing is not practical.

111. Cement, Rubber, Uncured

a. Characteristics. A solution of rubber in a volatile solvent which requires vulcanizing to cure.

b. Unit of Issue. One-fourth-pint can.

c. Use. To repair antiaircraft artillery cables after splicing to provide a continuous rubber coating.

112. Cement, Rubber, Vulcanizing, Quick Cure, Cold Process, Gray

a. Characteristics. A gray, liquid rubber cement which is air-curing and does not require vulcanizing.

b. Units of Issue. (1) One quart.

(2) One gallon.

(3) Five gallons.

(4) Fifty-five gallons.

c. Use. It is suitable for repairing or patching of rubber goods where it is not practicable to vulcanize.

113. Cement, Sealing or Plugging

a. Characteristics. A surface hardening sealing compound available in four colors.

(1) Class A—red.

(2) Class B—yellow.

(3) Class C—black.

(4) Class D—olive drab.

b. Unit of Issue. Four-ounce can.

c. Use. For sealing over screws in instruments, binoculars, field glasses, etc.

114. Cement, Thermo-Setting (Optician's)

a. Characteristics. (1) A low temperature, thermo-setting optical cement.

(2) Upon setting, this cement adheres to glass surfaces, and has an index of refraction within the range of optical glass.

b. Unit of Issue. Two-ounce bottle.

c. Use. (1) Optical cement for building up compound lenses.

(2) For use only by qualified optical shops.

d. Application. To be applied in accordance with instructions in TM 9–1501.

5. Cement, Watch Crystal (Unbreakable)

a. Characteristics. A clear liquid cement which dries to a light low finish.

b. Unit of Issue. Needle point tube.

c. Use. For cementing watch crystals.

6. Cement, Waterproof

a. Characteristics. An adhesive which is resistant to water, salt ter, and oil, both high and low temperatures. This adhesive will not ır marking ink.

b. Unit of Issue. Five gallons.

c. Use. For application and protection of labels.

7. Compound, Antiseize, Mica-Base

a. Characteristics. (1) A mixture of viscous petroleum oil and ely ground flake mica.

(2) This material is a nonconductor of electricity and possesses high ıt resistant qualities.

b. Unit of Issue. One-pound can.

c. Use. (1) For spark plug threads, hot surfaces, etc., to prevent zing, and to facilitate disassembly.

(2) Due to its insulating properties, this compound should not be ıd where mating parts are required to be in good electrical contact.

8. Compound, Battery Sealing

a. Characteristics. (1) An adhesive material, insoluble in sulfuric d.

(2) When applied to a hard surface such as hard rubber or glass, ı compound will not shrink, crack, or separate, and will adhere suffi- ntly to maintain an acidtight joint.

b. Unit of Issue. Twenty-five-pound slab.

c. Use. For sealing and patching damaged sealing on wet batteries.

d. Application. By pouring, after the compound has been melted a temperature of approximately 350° F.

9. Compound, Calking

a. Characteristics. A gray or black plastic material.

b. Unit of Issue. One gallon.

c. Use. For calking openings of strippable film type storage of anti- craft artillery.

0. Compound, Calking, Knife Grade

a. Characteristics. A gray or black doughlike compound, of such onsistency that it can be applied with a putty knife.

b. Units of I (1) One-pound can.

(2) Ten-pound can (for base shops, posts, arsenals, etc., only).

c. Use. For sealing windows in frames on fire control matériel.

121. Compound, Joint Sealing

a. Characteristics. A waterproof, nonhardening, sealing compound.

b. Unit of Issue. One-pound can.

c. Use. For sealing bolted and riveted surfaces, and under bolt heads on tanks or vehicles having tanklike hulls, to insure watertight hulls up to fording depths.

122. Compound, Sealing

a. Characteristics. Material is noncorrosive, nondrying, nonhygroscopic, permanently soft, puttylike compound.

b. Unit of Issue. One gallon.

c. Use. Sealing and setting plate glass in frames on automotive vehicles.

123. Compound, Sealing, Dip Coating

a. Characteristics. (1) A grade of high melting point amorphous wax which resists flaking at low temperatures.

(2) Suitable for sealings of wrappings or packages by dip coating.

b. Unit of Issue. Seventy-pound box (40 cakes).

c. Use. For sealing, by dip coating, of packages prepared for storage or shipment.

124. Compound, Sealing, Heavy

a. Characteristics. A light colored jellylike material.

b. Unit of Issue. One-fourth-pound jar.

c. Use. For sealing bell jar and other components of the optical coating machine to prevent loss of vacuum.

125. Compound, Sealing, Height Finder

a. Characteristics. A liquid cementing material, impervious to helium.

b. Unit of Issue. Eight-ounce can, with brush.

c. Use. For use on gaskets sealing the helium-filled compartments of height finders.

126. Compound, Sealing, Optical Lens

(Replaces compound, sealing, black, Navy.)

a. Characteristics. (1) A black, waxy, pitchlike, plastic material.

(2) This compound contains an inhibitor to prevent mold, fungus growth, and attack by mites.

3) When properly applied, this material will insure satisfactory
iesion to optical parts with no leakage of air or moisture, over a
le range of temperatures.
. Units of Issue. (1) Two-ounce can.
2) Eight-ounce can.
. Use. For setting optical elements in their cells.
l. Application. The compound must be worked by hand until it
omes soft and pliable.

7. Compound, Sealing, Tape

. Characteristics. A black viscous composition applied over non-
groscopic adhesive tape to protect the tape from the direct action
the elements.
. Units of Issue. (1) One gallon.
(2) Five gallons.
(3) Fifty-five gallons.
. Use. Apply after taping to seal nonhydroscopic adhesive tape.

8. Compound, Top Coating, Bituminous

. Characteristics. This material is a mixture of asphalt, fiber
sbestos) and solvent. A ⅛-inch coating of the material will set
thin 18 hours so that the surface is dry to handle.
. Units of Issue. (1) Five gallons.
(2) Fifty-five gallons.
. Use. For waterproofing tops of nailed wood crates.
l. Application. See TM 9–2854.

9. Glue, Animal (Flake)

. Characteristics. A medium grade glue of animal origin.
. Unit of Issue. One pound.
. Use. For general use in the cementing of wood joints.
d. Preparation for Use. (1) One pound of glue is added to 2
arts of water and allowed to soak, and then heated to brushing con-
tency.
(2) It is desirable to add ½ pound of glycerin as a plasticizer.

10. Grease, Asbestos (GK)

a. Characteristics. (1) A waterproof grease containing asbestos
er.
(2) Its cohesive and adhesive properties are such as to permit its
ing spread evenly on surfaces, worked into cracks, and molded
ound spark plugs and other projecting parts.
b. Unit of Issue. Twenty-five pounds.
c. Use. Wate- -oofing of Ordnance matériel for deep water ford-
g. Refer to 2853.

131. Lead Monoxide (Litharge), Technical

a. Characteristics. An amorphous reddish yellow powder.
b. Units of Issue. (1) One ounce.
(2) One pound.
c. Use. To make litharge cement when mixed with glycerin.

132. Lubricant, Tire Mold, Glycerin Base

a. Characteristics. A sodium sulphate ester of a mixture of highly
fatty alcohols.
b. Unit of Issue. One-pound can.
c. Use. Used in tire molds to prevent sticking and also to leave the
mold in a clean condition. The tire molds are usually sprayed with
0.5 percent solution of tire mold lubricant.

133. Putty, Linseed Oil, White Lead Whiting

a. Characteristics. (1) This putty, after thorough working with
the hands, has good plastic quality without sliminess or stickiness.
(2) It can be applied readily and smoothly with a putty knife.
(3) After being molded in place, it will hold its shape until set.
b. Units of Issue. (1) One pound.
(2) Five pounds.
c. Use. For wood sash glazing.

134. Sodium Silicate, Liquid

a. Characteristics. A viscous noninflammable liquid.
b. Unit of Issue. One gallon.
c. Use. For rebabbiting automotive bearings and inserts.

135. Solvent, Rubber

a. Characteristics. A water-white liquid. The initial boiling
point is between 125° and 140° F.
b. Units of Issue. (1) One gallon.
(2) Twenty-five gallons.
(3) Fifty gallons.
c. Use. To dissolve or disperse rubber in preparation of rubber
cements and in repair of mechanical rubber goods.

136. Tape, Adhesive, Nonhygroscopic, O. D. Color

a. Characteristics. (1) A strong adhesive tape treated with a
suitable protective film to resist moisture penetration.
(2) The adhesive tape will not corrode polished metal surfaces,
and is free from all materials which would injuriously affect dope,
lacquer, varnish, paint, or other surface finishes.
(3) The adhesive tape is soluble in either carbon tetrachloride or
benzene.

(4) It is olive drab in color.
b. Units of Issue. (1) One-inch roll by 60 yards.
(2) Two-inch roll by 60 yards.
(3) Four-inch roll by 60 yards.
(4) Six-inch roll by 60 yards.
c. Also Issued for Expendable Muzzle Covers. (1) Two-inch ll by 15 yards.
(2) Four-inch roll by 15 yards.
(3) Six-inch roll by 15 yards.
d. Use. (1) As expendable muzzle covers M1.
(2) For taping materials in preparation for shipment and storage.

37. Tape, Masking, Crepe-Backed

a. Characteristics. (1) This type tape is backed with crepe kraft per, which is impervious to and unaffected by paints, varnishes and her finishes.
(2) The adhesive, containing a rubber-resin base, is in no way harm- l to paints, varnishes, or other finishes.
(3) The adhesive is pressure-sensitive and requires no moisture, heat, other manner of preparation prior to applying the tape.
b. Units of Issue. (1) One roll (1 in. by 60 yd).
(2) One roll (2 in. by 60 yd).
c. Use. For masking in the application of paint or other finishes.

SECTION VII
MISCELLANEOUS MATERIALS

138. Ammudamp

a. Characteristics. A noninflammable 50-percent solution of H_2O and sodium ethyl potassium phosphate. Pour point is −40° F.
b. Unit of Issue. Fifty-five-gallon drum.
c. Use. For ammunition wet storage containers on vehicles.

139. Beeswax, Yellow

a. Characteristics. This wax is formed and deposited by the honey bee. New wax is light yellow that turns brown with age. The melting point is 63° C.
b. Unit of Issue. One pound.
c. Use. As a protective coating on metal when the matériel is being etched.

140. Blue, Prussian

This item has been canceled and pigments in oil, paint colors, color 2A, iron blue, will be used in lieu thereof.

141. Chalk

a. Chalk, Lump, White. (1) *Unit of issue.* One pound.
(2) Use. For shop use for laying out dimensions.
b. Chalk, Railroad, Blue, 1 Inch by 4 Inches. (1) *Unit of issue.* One gross.
(2) Use. For general marking on surfaces where white chalk is not readily seen.
c. Chalk, Railroad, White, 1 Inch by 4 Inches. (1) *Unit of issue.* One gross.
(2) *Use.* For general marking purposes, sight lines, rubber preservation, etc.

142. Clay, Plastic, Modeling

This item has been canceled and wood-substitute, plastic and solvent will be used in lieu thereof.

143. Compound, Antifog

a. Characteristics. A white, jellylike substance with a sweet odor.
b. Unit of Issue. Two-ounce jar.

Use. (1) To prevent condensation of moisture on windshields other glass surfaces.
2) Antifog compound will be used only on the outer surfaces of lenses and objective lenses. It will be applied sparingly with clean tissue paper, and care will be taken to cover the entire lens surwith a thin film of the compound. After the compound has been wed to dry, the lens will be polished lightly with clean, dry lens ıe paper to remove any excess compound. This procedure will be ated whenever necessary, the intervals between applications varywith climatic conditions.

. Compound, Water Repellent

Characteristics. Water repellent compound contains an acid is poisonous and corrosive. One application of water repellent pound lasts only 48 hours. Vision is not improved by the use of r repellent during dry weather.
aution: Extreme care must be taken to avoid contact with the or eyes. Do not use on metal, plastic, or coated optics.
Unit of Issue. One-half-cc glass vial with cotton applicator and e pad.
Use. (1) Water repellent compound is used on windshields, scope windows, indicator windows, and similar exposed glass surs to improve vision and to overcome objectionable interference ed by water adhering to the window glass during rain or during hibious landing operations. Glass surfaces treated with this comıd cannot be wet by water, which rolls off the glass in droplets.
2) This compound serves only as a water repellent and its appli-n must not be confused with the uses prescribed for antifog comıd. (See par. 143.)
Application. (1) Thoroughly clean and dry surfaces before ting them with water repellent compound.
2) Remove the gauze polishing pad packed with the vial.
3) Hold the vial with the cloth applicator end upwards. Then, g the fingers, crush the tip of the vial which is under the cloth icator.
4) Invert the vial, allowing the liquid to flow into the applicator. n use the applicator as a brush and apply a film of the compound ıe surface to be treated.
5) Polish the surface dry, using the gauze pad issued with the

6) The film of water repellent compound will be applied spary. One vial is sufficient for coating the heads and elbows of five scopes.

. Cover, Muzzle, Expendable, M1

tape, adhesive. ygroscopic, o. d. color. (See par 136.)

No longer used in strippable film. See compound, protective, strippable (sprayable) (par. 77).

147. Grease, Silicon, Medium

a. Characteristics. A jellylike material which is nonreactive with rubber and is noncorrosive.
b. Unit of Issue. Eight-ounce tube.
c. Use. Used in moistureproofing and fungiproofing of electrical connections on heavy antiaircraft artillery.

148. Gutta Percha

a. Characteristics. A low-melting-point material similar to sealing wax, which becomes plastic at about 140° F., and on hardening retains its shape.
b. Unit of Issue. One pound (procured locally for local issue only).
c. Use. For taking impressions of artillery bores.

149. Gypsum, Calcined, Fine

a. Characteristics. A fine, white powder which when mixed with water sets to a hard mass.
b. Unit of Issue. One pound.
c. Use. For setting leveling vials in optical equipment and fire control matériel.

150. Hydrogen Peroxide, Commercial, 100 Vol.

a. Characteristics. A water-white liquid which is a strong oxidizing agent.
b. Unit of Issue. Five-pound bottle.
c. Use. To reduce iron content in Parco-Lubrite bath.

151. Knife, Putty

a. Size. 1¼ inches by 3½ inches.
b. Unit of Issue. Each.
c. Use. For forcing putty into cracks and crevices preparatory to painting, and for scraping off old paint, etc.

152. Magnesium Fluoride (Chem. Pure)

a. Characteristics. A white crystalline substance.
b. Unit of Issue. One-fourth-pound jar.
c. Use. Used in coating of optics to reduce the reflection of light.

153. Manganese Carbonate, Technical Grade

a. Characteristics. A light white water-insoluble powder.

. UNIT OF ISSUE. Ten pounds.
. USE. To neutralize the free acid after reduction of iron content Parco-Lubrite process.

4. Methyl Orange Xylene Cyanole, Solution (Indicator)

. CHARACTERISTICS. An orange-red liquid.
. UNIT OF ISSUE. Sixteen-ounce container.
. USE. An indicator in the testing for free acid in Parco-Lubrite cess. It turns light green when applied to an acid solution.

5. Needle, Collar, Regular Bend, 4½-Inch

. CHARACTERISTICS. (1) A heavy gage, curved needle, 4½ inches g, with a wide eye for twine.
2) Suitable for sewing heavy fabric, such as burlap or canvas.
. UNIT OF ISSUE. Each.
. USES. (1) For sewing burlap on the bore brush or sponge dur- the cleaning of artillery bores.
2) For general use in sewing burlap or canvas.

6. Oil, Low Vapor Pressure

. CHARACTERISTICS. A specially refined colorless oil with high orption capacity.
. UNIT OF ISSUE. One thousand-gram can.
. USE. Used in the diffusion pump on the optical coating machine.

7. Palm, Sewing (Sailmakers' and Saddlers')

. CHARACTERISTICS. A small metal cup mounted on a heavy her strap which fits around the hand in a manner that holds the al cup over the palm.
. UNIT OF ISSUE. Each.
. USE. Used to protect the hand when using the steel collar needle.

8. Paper, Black, Velour

. CHARACTERISTICS. (1) A lightweight paper of even texture and olished finish.
2) The black color is fast and will not run under wet conditions.
. UNIT OF ISSUE. Roll (41 in. by 11 yd.).
. USE. For lining interiors of certain optical instruments.

9. Paper, Litmus, Blue

. CHARACTERISTICS. A vial containing small strips of blue paper.
. UNIT OF ISSUE. One-fourth inch by 2 inch, 100 strips with vial l container.
. USE. Used by immersion of a strip of the paper in a solution to ck for acidity. If the immersed paper turns red, acid is present the solution.

160. Paper, Stencil Board (Oiled)

a. CHARACTERISTICS. (1) A firm, noncurling, oiled paper board, having a smooth ink-repellent surface.
(2) Sheets are 0.015 inch thick, and 1,000 sheets (24 in. by 36 in.), weight 520 pounds.
b. UNITS OF ISSUE. (1) Each (12-in. by 36-in. sheet).
(2) Each (24-in. by 36-in. sheet).
c. USE. For making stencils.

161. Paraffin Wax

a. CHARACTERISTICS. (1) Available in two grades, with melting points as indicated:
(*a*) Grade A (melting point 130° to 132° F.).
(*b*) Grade C (melting point 120° to 122° F.).
(2) A white, colorless mass. Paraffin wax is a fully refined, commercial petroleum wax, free from animal and vegetable waxes or other adulterants.
b. UNIT OF ISSUE. One-pound box.
c. USE. For molding, etc.

162. Phenolphthalein Test Solution, USP, 1 Percent in Ethyl Alcohol

a. CHARACTERISTICS. A water-white solution.
b. UNIT OF ISSUE. Sixteen-ounce container.
c. USE. An indicator in testing for percentage of acid phosphates in Parco-Lubrite process.

163. Pigments in Oil, Paint Colors, Color 2A, Iron Blue

a. CHARACTERISTICS. (1) Pigment ground in linseed oil (with a small amount of volatile thinner) together with (where necessary) small amounts of wetting and dispersing agents to a semifluid or fluid type consistency.
(2) Readily mixed with a thinning liquid to form a smooth product of brushing consistency.
(3) Has a relatively low specific gravity and high bulk.
(4) Susceptible to action of alkalies.
b. UNITS OF ISSUE. (1) One pint.
(2) One quart.
c. USE. As a marking material in the fitting of bearings. See TM 9-2851 (when published) for further sizes and usage.

164. Potassium Permanganate Solution, Titrating (1 ml Equals .0100 Gram Iron)

a. CHARACTERISTICS. A pink aqueous solution.
b. UNIT OF ISSUE. One-half-gallon dark brown bottle.

Use. A titrating solution to determine the percentage of iron in
o-Lubrite process.

. Sodium Hydroxide, A. C. S., Pellets

Characteristics. (1) A highly caustic, white substance in pel-
orm.
) Because of its caustic nature, it is very destructive to the body
clothing. Burns must be treated as outlined under soda, caustic
) (par. 59).
) Because of its hygroscopic nature, it must be kept in a tightly
ed container at all times.
Unit of Issue. One-pound can.
Use. For preparation of glycerin-water recoil mechanism fluid.

). Sodium Hydroxide Solution, USP, Volumetric 1/10 Normal

. Characteristics. A water solution commonly known as caustic
a.
. Unit of Issue. One gallon.
. Use. To determine the percentage of acid phosphates in Parco-
rite process.

7. Stencils

. Designs and Sizes in Which Available.
(1) STENCIL, Insignia, cardboard, star.
Sizes: 4 in., 6 in., 10 in., 12 in., 15 in., 16 in., 20 in., 25 in., 32 in., 36 in.
(2) STENCIL, Paper, size 1 in.
Set: All numerals, 0 to 9, inclusive.
(3) STENCIL, Paper, size 1 in.
(*a*) U. S. A.
(*b*) W.
(4) STENCIL, Paper, size 2 in.
Set: All numerals, 0 to 9, inclusive.
(5) STENCIL, Paper, size 2 in.
(*a*) S.
(*b*) U. S. A.
(*c*) W.
(6) STENCIL, Paper, size 4 in.
Set: All numerals, 0 to 9, inclusive.
(7) STENCIL, Paper, gummed back, size 4.
(*a*) U. S. A.
(*b*) W.
(8) STENCIL, Paper, cross, 40 in.
(9) STENCIL, Paper, set.
Set—consisting of—
Two each caduceus.
Two each 4-in. cross.
Two each 8-in. cross.
Two each 20-in. cross.
One each "ambulance".

b. Unit of Issue. Set.
c. Use. For marking matériel in accordance with AR 850–5.

168. Stopper, Cork, Straight

a. Characteristics. An uncemented, Standard XXXX, extra long cork made of natural corkwood, 3/8 inch in diameter and 7/8 inch in length.
b. Unit of Issue. *M*.
c. Use. (1) As an alternate for tapered cork stoppers for plugging the muzzle of the cal. .30 machine gun; the muzzles and gas ports of the cal. .30 U. S. rifle, cal. .20 U. S. carbine, and cal. .30 automatic rifle during Parco-Lubriting process.
(2) New corks must be soaked for 15 minutes at 200° F. in 10 percent solution of trisodium-phosphate and water to remove tannic acid which may cause discoloration of the barrel. After above treatment, wash with clean water and dry. Then dip in light oil before use.

169. Stopper, Cork, Tapered

a. Characteristics. An uncemented cork made of natural corkwood, in the grades, classes, and numbers listed under *b* below.
b. Units of Issue. (1) Grade A, Class 2, No. 000 (regular length)—M.
(2) Grade A, Class 2, No. 1 (regular length)—M.
(3) Grade A, Class 3, No. 4 (extra long)—M.
(4) Grade A, Class 3, No. 9 (extra long)—M.
c. Uses. (1) No. 000 is used for plugging the muzzle and breech of the cal. .22 U. S. rifle during Parco-Lubriting process.
(2) No. 1 is used for plugging the muzzle of the cal. .30 machine gun; the muzzles and gas ports of the cal. .30 U. S. rifle, M1, and cal. .30 automatic rifle; and muzzle, breech and gas port of the cal. .30 U. S. carbine during Parco-lubricating process.
(3) No. 4 is used in the cal. .45 pistol and submachine gun, M3; in the muzzle of the cal. .50 machine gun; and in the breech of the cal. .30 rifle and cal. .30 machine gun.
(4) No. 9 is used in the breech of the cal. .50 machine gun.
(5) New corks must be soaked for 15 minutes at 200° F. in 10-
rcent solution of trisodium-phosphate and water to remove tannic

ɔid which may cause discoloration of the barrel. After above treatment, wash with clean water and dry. Then dip in light oil before use.

70. Talcum, Technical (Soapstone), Powdered

a. CHARACTERISTICS. A fine, greasy, soft white powder.

b. UNITS OF ISSUE. (1) One-pound can, sifter type, with cap.

(2) Five-pound can.

c. USE. For repair of tires and for making sectional curing bag aint. For dusting of interior surfaces of tires.

71. Wax, Stitching, Brown

a. CHARACTERISTICS. A hard wax substance with a melting point of 122° to 126° F. The usual commercial color is brown or black.

b. UNIT OF ISSUE. One-half-pound ball.

c. USE. To wax thread for sewing of leather goods.

72. Wood Substitute, Plastic; and Solvent

a. CHARACTERISTICS. (1) *Plastic.* (*a*) Light colored, nontoxic, water resistant material containing wood fibers and other materials to form a mixture that will be plastic, easily formed, quick setting and hardening.

(*b*) Can be readily cut, sawed, bored, reamed, and filed. Withstands driving of nails into it without cracking. Adheres strongly to wood and/or metal surfaces.

(2) *Solvent.* Light colored, nontoxic liquid that will soften plastic wood substitute.

b. UNITS OF ISSUE. (1) Plastic—One-pound can.

(2) Solvent—One-half-pint can.

c. USE. Building up or filling in, parts of wood patterns or joiner work, and filling in over countersunk screws, etc.

APPENDIX I
REFERENCES

1. Publications Indexes

The following publications indexes should be consulted frequently for latest changes or revisions of the references given in this section and for new publications relating to matériel covered in this manual:

Ordnance Supply Catalog Index (index to SNL's)	WD Supply Cat. ORD 2 OPSI
List and Index of War Department Publications	FM 21–6
List of War Department Films, Film Strips, and Recognition Film Slides	FM 21–7
Military Training Aids (listing graphic training aids, models, devices, and displays)	FM 21–8

2. Standard Nomenclature Lists

Cleaning, Preserving, and Lubricating Materials; Recoil Fluids, Special Oils, and Miscellaneous Related Items	WD Supply Cat. ORD 3 SNL K–1
Soldering, Brazing, and Welding Materials; Gases and Related Items	WD Supply Cat. ORD 5 SNL K–2

3. Explanatory Publications

a. CLEANING, PRESERVING MATERIALS, ETC.

instructions for major items and spare parts for ordnance general supplies	PS No. 1000
Preparation of Ordnance Matériel for Deep Water Fording	TM 9–2853
Preparation of Unboxed Ordnance Matériel for Shipment	SB 9–4
Preservation and Care of Seacoast and Railway Artillery Matériel for Active and Inactive Periods and Long Term Storage	U.S.15910 SB 9–54

Surplus Unboxed Motor Vehicles	SB 9–67
Preservation of Ordnance Matériel Not in Regular Use	SB 9–28
Protection of Ordnance Matériel in Open Storage	SB 9–47
Rust Preventive Materials	SB 9–31
b. General.	
Basic Maintenance Manual	TM 38–650
Decontamination	TM 3–220
Defense Against Chemical Attack	FM 21–40
Dictionary of United States Army Terms	TM 20–205
Distribution and Issue of Ordnance General Supplies	SB 9–3
Inspection of Ordnance Matériel	TM 9–1100
Military Chemistry and Chemical Agents	TM 3–215
Ordnance Maintenance: Fire Extinguishers	TM 9–1799
Precautions in Handling Gasoline	AR 850–20
Standard Artillery and Fire Control Matériel	TM 9–2300
Stevedoring	TM 55–310
Instruction Guide, Welding—Theory and Application	TM 9–2852
c. Methods and Procedures.	
Bills of Lading	TM 55–550
Driver Selection Training and Supervision, Wheeled Vehicles	TM 21–300
Duplicating Methods and Forms War Department Shipping Document	ASF Manual M405
Standard Operating Procedure for Movement of Equipment and Supplies to Ports of Embarkation, Canada, and Mexico	TM 38–235
Station Supply Procedure	TM 38–403
War Department Shipping Document	ASF Manual M401

Compressed Gas Cylinders; Safe Handling, Storing, Shipping, Using	AR 850–60
Instructions for Preservation of Mobile Artillery Matériel for Stand-By Storage	SB 9–61
Instruction Guide—Ordnance Packaging and Shipping (Posts, Camps, and Stations)	TM 9–2854
Loading of commodities on open top and in box cars, Special Supplements No. 1 and No. 2	Published by Assoc. of Amer. RRs
Stock Control Manual for Stations	TM 38–400
Stand-by and Long-Term Storage for Antiaircraft Artillery	SB 9–68
Storage in the Zone of Interior	TM 38–402
Storage, Inspection, and Issue of Boxed and Unboxed Motor Vehicles and Preparation of Unserviceable Vehicles for Storage	SB 9–63
e. Storage and Shipment Charts.	
Ordnance Storage and Shipment Chart Group A	SB 9–OSSC–A
Ordnance Storage and Shipment Chart Group B	SB 9–OSSC–B
Ordnance Storage and Shipment Chart Group C	SB 9–OSSC–C
Ordnance Storage and Shipment Chart Group D	SB 9–OSSC–D
Ordnance Storage and Shipment Chart Group F	SB 9–OSSC–F
Ordnance Storage and Shipment Chart Group G	SB 9–OSSC–G
Ordnance Storage and Shipment Chart Group L	SB 9–OSSC–L

INDEX

U. S. GOVERNMENT PRINTING OFFICE